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Reading data base.  
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LLNL\_AQUEOUS\_MODEL\_PARAMETERS  
NAMED\_EXPRESSIONS  
SOLUTION\_MASTER\_SPECIES  
SOLUTION\_SPECIES  
PHASES  
EXCHANGE\_MASTER\_SPECIES  
EXCHANGE\_SPECIES  
SURFACE\_MASTER\_SPECIES  
SURFACE\_SPECIES  
RATES  
END

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Reading input data for simulation 1.  
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DATABASE C:\Program Files (x86)\USGS\Phreeqc Interactive 2.18.5570\database\llnl.dat  
SOLUTION 1 Flujo 3  
temp 25  
pH 3.07  
pe 17  
redox pe  
units mg/l  
density 1  
Cl 40.91  
S(6) 1264  
Al 21.6  
As 3.82  
Ca 124.8  
Cu 40.91  
Fe 41.51  
K 35.01  
Mg 13.42  
Mn 24.26  
Na 20.89  
Zn 9.71  
C(4) 0  
water 1 # kg  
SOLUTION 2 Inter 3  
temp 25  
units mg/l  
pe 12  
pH 2.29  
Cl 39.1  
S(6) 1113.00  
Al 34.60  
As 0.01  
Ca 305.00  
Cu 0.13  
Fe 12.16  
K 8.67  
Mg 29.67  
Mn 13.97  
Na 65.26  
Zn 0.02  
C(4) 0  
MIX 1  
1 1

```

2      3
SELECTED_OUTPUT
file          DAM_AGUASUP
ph            true
percent_error true
totals        Al  As  Cu  Fe  Mg  Mn  Zn
              S(6)

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Beginning of initial solution calculations.  
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Initial solution 1.      Flujo 3

-----Solution composition-----

Elements	Molality	Moles
Al	8.019e-004	8.019e-004
As	5.107e-005	5.107e-005
Ca	3.119e-003	3.119e-003
Cl	1.156e-003	1.156e-003
Cu	6.448e-004	6.448e-004
Fe	7.445e-004	7.445e-004
K	8.969e-004	8.969e-004
Mg	5.531e-004	5.531e-004
Mn	4.423e-004	4.423e-004
Na	9.102e-004	9.102e-004
S(6)	1.318e-002	1.318e-002
Zn	1.487e-004	1.487e-004

-----Description of solution-----

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pH = 3.070
pe = 17.000
Activity of water = 1.000
Ionic strength = 3.218e-002
Mass of water (kg) = 1.000e+000
Total alkalinity (eq/kg) = -2.266e-003
Total carbon (mol/kg) = 0.000e+000
Total CO2 (mol/kg) = 0.000e+000
Temperature (deg C) = 25.000
Electrical balance (eq) = -1.053e-002
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -30.80
Iterations = 8
Total H = 1.110530e+002
Total O = 5.557899e+001

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-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	9.741e-004	8.511e-004	-3.011	-3.070	-0.059
OH-	1.344e-011	1.132e-011	-10.872	-10.946	-0.075
H2O	5.553e+001	9.996e-001	1.744	-0.000	0.000
Al	8.019e-004				
AlSO4+	4.097e-004	3.464e-004	-3.388	-3.460	-0.073
Al+3	2.262e-004	6.552e-005	-3.646	-4.184	-0.538
Al(SO4)2-	1.643e-004	1.389e-004	-3.784	-3.857	-0.073
AlOH+2	1.676e-006	8.621e-007	-5.776	-6.064	-0.289
Al(OH)2+	2.781e-009	2.351e-009	-8.556	-8.629	-0.073
Al2(OH)2+4	1.546e-009	1.208e-010	-8.811	-9.918	-1.107
HALO2	4.020e-012	4.020e-012	-11.396	-11.396	0.000
Al3(OH)4+5	3.475e-013	7.050e-015	-12.459	-14.152	-1.693
AlO2-	1.914e-015	1.618e-015	-14.718	-14.791	-0.073
NaAlO2	2.296e-019	2.296e-019	-18.639	-18.639	0.000
Al13O4(OH)24+7	0.000e+000	0.000e+000	-51.563	-54.881	-3.319

As(-3)	0.000e+000					
AsH3	0.000e+000	0.000e+000	-151.256	-151.256	0.000	
As(3)	2.419e-026					
HAsO2	1.291e-026	1.291e-026	-25.889	-25.889	0.000	
As(OH)3	1.128e-026	1.128e-026	-25.948	-25.948	0.000	
H2AsO3-	9.588e-033	8.107e-033	-32.018	-32.091	-0.073	
AsO2-	9.170e-033	7.753e-033	-32.038	-32.111	-0.073	
AsO2OH-2	1.838e-040	0.000e+000	-39.736	-40.031	-0.296	
As(5)	5.107e-005					
H2AsO4-	4.531e-005	3.831e-005	-4.344	-4.417	-0.073	
H3AsO4	5.743e-006	5.743e-006	-5.241	-5.241	0.000	
HAsO4-2	1.476e-008	7.471e-009	-7.831	-8.127	-0.296	
AsO4-3	1.045e-016	2.252e-017	-15.981	-16.647	-0.667	
Ca	3.119e-003					
Ca+2	2.219e-003	1.192e-003	-2.654	-2.924	-0.270	
CaSO4	8.999e-004	8.999e-004	-3.046	-3.046	0.000	
CaCl+	2.891e-007	2.445e-007	-6.539	-6.612	-0.073	
CaCl2	2.781e-010	2.781e-010	-9.556	-9.556	0.000	
CaOH+	2.340e-013	1.978e-013	-12.631	-12.704	-0.073	
Cl(-1)	1.156e-003					
Cl-	1.154e-003	9.673e-004	-2.938	-3.014	-0.077	
CuCl+	6.621e-007	5.598e-007	-6.179	-6.252	-0.073	
MnCl+	3.434e-007	2.903e-007	-6.464	-6.537	-0.073	
CaCl+	2.891e-007	2.445e-007	-6.539	-6.612	-0.073	
HCl	1.849e-007	1.849e-007	-6.733	-6.733	0.000	
MgCl+	1.568e-007	1.326e-007	-6.805	-6.878	-0.073	
NaCl	1.265e-007	1.265e-007	-6.898	-6.898	0.000	
ZnCl+	9.697e-008	8.198e-008	-7.013	-7.086	-0.073	
KCl	2.345e-008	2.345e-008	-7.630	-7.630	0.000	
FeCl+2	9.839e-009	5.061e-009	-8.007	-8.296	-0.289	
FeCl2+	4.688e-009	3.963e-009	-8.329	-8.402	-0.073	
CuCl2	2.852e-010	2.852e-010	-9.545	-9.545	0.000	
CaCl2	2.781e-010	2.781e-010	-9.556	-9.556	0.000	
ZnCl2	9.263e-011	9.263e-011	-10.033	-10.033	0.000	
FeCl+	2.730e-012	2.308e-012	-11.564	-11.637	-0.073	
Zn(OH)Cl	1.646e-012	1.646e-012	-11.783	-11.783	0.000	
MnCl3-	7.018e-014	5.934e-014	-13.154	-13.227	-0.073	
ZnCl3-	5.853e-014	4.948e-014	-13.233	-13.306	-0.073	
ZnCl4-2	7.166e-016	3.628e-016	-15.145	-15.440	-0.296	
FeCl2	1.198e-017	1.198e-017	-16.922	-16.922	0.000	
FeCl4-	5.273e-018	4.458e-018	-17.278	-17.351	-0.073	
CuCl2-	8.492e-020	7.180e-020	-19.071	-19.144	-0.073	
CuCl4-2	9.890e-021	5.007e-021	-20.005	-20.300	-0.296	
CuCl3-2	8.809e-022	4.460e-022	-21.055	-21.351	-0.296	
FeCl4-2	6.397e-023	3.239e-023	-22.194	-22.490	-0.296	
Cl(1)	3.282e-017					
HClO	3.282e-017	3.282e-017	-16.484	-16.484	0.000	
ClO-	1.230e-021	1.040e-021	-20.910	-20.983	-0.073	
Cl(3)	3.477e-032					
HClO2	1.792e-032	1.792e-032	-31.747	-31.747	0.000	
ClO2-	1.685e-032	1.424e-032	-31.773	-31.846	-0.073	
Cl(5)	1.650e-029					
ClO3-	1.650e-029	1.389e-029	-28.783	-28.857	-0.075	
Cl(7)	8.035e-031					
ClO4-	8.027e-031	6.758e-031	-30.095	-30.170	-0.075	
ZnClO4+	7.628e-034	6.449e-034	-33.118	-33.191	-0.073	
Cu(1)	1.456e-018					
Cu+	1.370e-018	1.158e-018	-17.863	-17.936	-0.073	
CuCl2-	8.492e-020	7.180e-020	-19.071	-19.144	-0.073	
CuCl3-2	8.809e-022	4.460e-022	-21.055	-21.351	-0.296	
Cu(2)	6.448e-004					
Cu+2	3.937e-004	2.116e-004	-3.405	-3.675	-0.270	
CuSO4	2.504e-004	2.504e-004	-3.601	-3.601	0.000	
CuCl+	6.621e-007	5.598e-007	-6.179	-6.252	-0.073	
CuOH+	1.516e-008	1.282e-008	-7.819	-7.892	-0.073	
CuCl2	2.852e-010	2.852e-010	-9.545	-9.545	0.000	
CuCl4-2	9.890e-021	5.007e-021	-20.005	-20.300	-0.296	

CuO2-2	2.825e-031	1.430e-031	-30.549	-30.845	-0.296
Fe(2)	8.779e-009				
Fe+2	6.095e-009	3.275e-009	-8.215	-8.485	-0.270
FeSO4	2.682e-009	2.682e-009	-8.572	-8.572	0.000
FeCl+	2.730e-012	2.308e-012	-11.564	-11.637	-0.073
FeOH+	1.439e-015	1.216e-015	-14.842	-14.915	-0.073
FeCl2	1.198e-017	1.198e-017	-16.922	-16.922	0.000
FeCl4-2	6.397e-023	3.239e-023	-22.194	-22.490	-0.296
Fe(OH)2	1.135e-023	1.135e-023	-22.945	-22.945	0.000
Fe(OH)3-	6.276e-031	5.306e-031	-30.202	-30.275	-0.073
Fe(OH)4-2	0.000e+000	0.000e+000	-41.910	-42.205	-0.296
Fe(3)	7.445e-004				
FeOH+2	4.629e-004	2.381e-004	-3.335	-3.623	-0.289
Fe(OH)2+	1.095e-004	9.261e-005	-3.960	-4.033	-0.073
Fe+3	1.084e-004	3.140e-005	-3.965	-4.503	-0.538
Fe2(OH)2+4	1.953e-005	1.526e-006	-4.709	-5.816	-1.107
FeSO4+	1.857e-005	1.570e-005	-4.731	-4.804	-0.073
Fe(SO4)2-	1.622e-006	1.371e-006	-5.790	-5.863	-0.073
Fe3(OH)4+5	1.455e-006	2.953e-008	-5.837	-7.530	-1.693
Fe(OH)3	5.087e-008	5.087e-008	-7.294	-7.294	0.000
FeCl+2	9.839e-009	5.061e-009	-8.007	-8.296	-0.289
FeCl2+	4.688e-009	3.963e-009	-8.329	-8.402	-0.073
Fe(OH)4-	1.775e-014	1.501e-014	-13.751	-13.824	-0.073
FeCl4-	5.273e-018	4.458e-018	-17.278	-17.351	-0.073
H(0)	0.000e+000				
H2	0.000e+000	0.000e+000	-43.244	-43.240	0.003
K	8.969e-004				
K+	8.613e-004	7.219e-004	-3.065	-3.141	-0.077
KSO4-	3.561e-005	3.011e-005	-4.448	-4.521	-0.073
KCl	2.345e-008	2.345e-008	-7.630	-7.630	0.000
KHSO4	2.261e-008	2.261e-008	-7.646	-7.646	0.000
KOH	2.940e-015	2.940e-015	-14.532	-14.532	0.000
Mg	5.531e-004				
Mg+2	3.107e-004	1.755e-004	-3.508	-3.756	-0.248
MgSO4	2.422e-004	2.422e-004	-3.616	-3.616	0.000
MgCl+	1.568e-007	1.326e-007	-6.805	-6.878	-0.073
Mg4(OH)4+4	0.000e+000	0.000e+000	-41.386	-42.493	-1.107
Mn(2)	4.423e-004				
Mn+2	2.623e-004	1.410e-004	-3.581	-3.851	-0.270
MnSO4	1.797e-004	1.797e-004	-3.746	-3.746	0.000
MnCl+	3.434e-007	2.903e-007	-6.464	-6.537	-0.073
MnOH+	5.033e-012	4.255e-012	-11.298	-11.371	-0.073
MnCl3-	7.018e-014	5.934e-014	-13.154	-13.227	-0.073
Mn2OH+3	2.782e-015	6.427e-016	-14.556	-15.192	-0.636
Mn(OH)2	1.227e-020	1.227e-020	-19.911	-19.911	0.000
Mn2(OH)3+	4.793e-023	4.052e-023	-22.319	-22.392	-0.073
Mn(OH)3-	1.598e-029	1.351e-029	-28.796	-28.869	-0.073
Mn(OH)4-2	2.655e-040	1.344e-040	-39.576	-39.872	-0.296
Mn(3)	1.627e-012				
Mn+3	1.627e-012	3.760e-013	-11.789	-12.425	-0.636
Mn(6)	3.607e-030				
MnO4-2	3.607e-030	1.826e-030	-29.443	-29.738	-0.296
Mn(7)	9.551e-023				
MnO4-	9.551e-023	8.041e-023	-22.020	-22.095	-0.075
Na	9.102e-004				
Na+	8.800e-004	7.440e-004	-3.056	-3.128	-0.073
NaSO4-	3.004e-005	2.540e-005	-4.522	-4.595	-0.073
NaCl	1.265e-007	1.265e-007	-6.898	-6.898	0.000
NaOH	1.452e-015	1.452e-015	-14.838	-14.838	0.000
NaAlO2	2.296e-019	2.296e-019	-18.639	-18.639	0.000
O(0)	3.822e-006				
O2	1.911e-006	1.926e-006	-5.719	-5.715	0.003
S(6)	1.318e-002				
SO4-2	1.020e-002	5.166e-003	-1.991	-2.287	-0.296
CaSO4	8.999e-004	8.999e-004	-3.046	-3.046	0.000
HSO4-	5.254e-004	4.442e-004	-3.280	-3.352	-0.073
AlSO4+	4.097e-004	3.464e-004	-3.388	-3.460	-0.073

CuSO4	2.504e-004	2.504e-004	-3.601	-3.601	0.000
MgSO4	2.422e-004	2.422e-004	-3.616	-3.616	0.000
MnSO4	1.797e-004	1.797e-004	-3.746	-3.746	0.000
Al(SO4)2-	1.643e-004	1.389e-004	-3.784	-3.857	-0.073
ZnSO4	5.476e-005	5.476e-005	-4.262	-4.262	0.000
KSO4-	3.561e-005	3.011e-005	-4.448	-4.521	-0.073
NaSO4-	3.004e-005	2.540e-005	-4.522	-4.595	-0.073
FeSO4+	1.857e-005	1.570e-005	-4.731	-4.804	-0.073
Fe(SO4)2-	1.622e-006	1.371e-006	-5.790	-5.863	-0.073
KHSO4	2.261e-008	2.261e-008	-7.646	-7.646	0.000
FeSO4	2.682e-009	2.682e-009	-8.572	-8.572	0.000
H2SO4	3.567e-010	3.567e-010	-9.448	-9.448	0.000
Zn	1.487e-004				
Zn+2	9.388e-005	5.045e-005	-4.027	-4.297	-0.270
ZnSO4	5.476e-005	5.476e-005	-4.262	-4.262	0.000
ZnCl+	9.697e-008	8.198e-008	-7.013	-7.086	-0.073
ZnCl2	9.263e-011	9.263e-011	-10.033	-10.033	0.000
ZnOH+	7.685e-011	6.498e-011	-10.114	-10.187	-0.073
Zn(OH)Cl	1.646e-012	1.646e-012	-11.783	-11.783	0.000
ZnCl3-	5.853e-014	4.948e-014	-13.233	-13.306	-0.073
ZnCl4-2	7.166e-016	3.628e-016	-15.145	-15.440	-0.296
Zn(OH)2	3.268e-016	3.268e-016	-15.486	-15.486	0.000
Zn(OH)3-	1.407e-024	1.190e-024	-23.852	-23.925	-0.073
ZnClO4+	7.628e-034	6.449e-034	-33.118	-33.191	-0.073
Zn(OH)4-2	4.705e-034	2.382e-034	-33.327	-33.623	-0.296

-----Saturation indices-----

Phase	SI	log IAP	log KT	
Al	-140.60	9.31	149.91	Al
Al(g)	-191.31	9.31	200.62	Al
Al2(SO4)3	-34.13	-15.23	18.90	Al2(SO4)3
Al2(SO4)3:6H2O	-16.78	-15.23	1.56	Al2(SO4)3:6H2O
Alum-K	-6.93	-11.90	-4.97	KAl(SO4)2:12H2O
Alunite	-1.38	-1.85	-0.47	KAl3(OH)6(SO4)2
Anhydrite	-0.86	-5.21	-4.35	CaSO4
Antarcticite	-13.05	-8.95	4.09	CaCl2:6H2O
Antlerite	-9.76	-1.03	8.73	Cu3(SO4)(OH)4
Aphthitalite	-13.24	-17.13	-3.89	NaK3(SO4)2
Arcanite	-6.73	-8.57	-1.84	K2SO4
Arsenolite	-50.48	-70.32	-19.84	As2O3
As	-73.56	-30.87	42.68	As
As2O5	-17.11	-14.97	2.14	As2O5
As4O6(cubi)	-100.82	-140.64	-39.82	As4O6
As4O6(mono)	-100.59	-140.64	-40.05	As4O6
Atacamite	-16.57	-2.31	14.26	Cu4Cl2(OH)6
Bassanite	-1.50	-5.21	-3.71	CaSO4:0.5H2O
Birnessite	-10.64	-96.19	-85.55	Mn8O14:5H2O
Bischofite	-14.18	-9.79	4.39	MgCl2:6H2O
Bixbyite	-5.47	-6.43	-0.96	Mn2O3
Bloedite	-12.11	-14.59	-2.48	Na2Mg(SO4)2:4H2O
Boehmite	-2.52	5.03	7.55	AlO2H
Brochantite	-13.99	1.43	15.42	Cu4(SO4)(OH)6
Brucite	-13.90	2.38	16.28	Mg(OH)2
Ca	-133.76	6.07	139.83	Ca
Ca(g)	-159.00	6.07	165.07	Ca
Ca2Al2O5:8H2O	-43.09	16.48	59.57	Ca2Al2O5:8H2O
Ca2Cl2(OH)2:H2O	-32.03	-5.74	26.29	Ca2Cl2(OH)2:H2O
Ca3(AsO4)2	-23.13	-5.32	17.80	Ca3(AsO4)2
Ca3Al2O6	-93.33	19.70	113.03	Ca3Al2O6
Ca4Al2Fe2O10	-108.15	32.33	140.48	Ca4Al2Fe2O10
Ca4Al2O7:13H2O	-84.34	22.92	107.25	Ca4Al2O7:13H2O
Ca4Al2O7:19H2O	-80.77	22.91	103.68	Ca4Al2O7:19H2O
Ca4Cl2(OH)6:13H2O	-67.63	0.69	68.33	Ca4Cl2(OH)6:13H2O
CaAl2O4	-33.64	13.27	46.91	CaAl2O4
CaAl2O4:10H2O	-24.73	13.27	37.99	CaAl2O4:10H2O

CaAl4O7	-45.27	23.32	68.59	CaAl4O7
Carnallite	-20.21	-15.94	4.27	KMgCl3:6H2O
CaSO4:0.5H2O(beta)	-1.68	-5.21	-3.54	CaSO4:0.5H2O
Chalcanthite	-3.33	-5.96	-2.63	CuSO4:5H2O
Chalcocyanite	-8.87	-5.96	2.91	CuSO4
Chloromagnesite	-31.60	-9.78	21.82	MgCl2
Cl2(g)	-18.02	-15.03	2.99	Cl2
Claudetite	-50.53	-70.32	-19.80	As2O3
Corundum	-8.24	10.05	18.29	Al2O3
Cu	-26.17	5.32	31.50	Cu
Cu(g)	-78.33	5.32	83.66	Cu
CuCl2	-13.42	-9.70	3.72	CuCl2
Cuprite	-27.83	-29.73	-1.91	Cu2O
Delafoosite	-3.72	-10.16	-6.44	CuFeO2
Diaspore	-2.12	5.03	7.15	AlHO2
Epsomite	-4.08	-6.04	-1.96	MgSO4:7H2O
Ettringite	-58.40	4.06	62.46	Ca6Al2(SO4)3(OH)12:26H2O
Fe	-58.50	0.51	59.02	Fe
Fe(OH)2	-16.24	-2.35	13.89	Fe(OH)2
Fe(OH)3	-0.93	4.71	5.64	Fe(OH)3
Fe2(SO4)3	-18.91	-15.87	3.05	Fe2(SO4)3
FeO	-15.87	-2.34	13.52	FeO
Ferrite-Ca	-8.87	12.63	21.50	CaFe2O4
Ferrite-Cu	1.60	11.88	10.28	CuFe2O4
Ferrite-Dicalcium	-40.95	15.85	56.80	Ca2Fe2O5
Ferrite-Mg	-9.22	11.80	21.02	MgFe2O4
Ferrite-Zn	-0.44	11.26	11.70	ZnFe2O4
FeSO4	-13.38	-10.77	2.61	FeSO4
Gibbsite	-2.71	5.03	7.74	Al(OH)3
Glauberite	-8.29	-13.75	-5.47	Na2Ca(SO4)2
Goethite	4.18	4.71	0.53	FeOOH
Gypsum	-0.68	-5.21	-4.53	CaSO4:2H2O
H2(g)	-40.14	-43.24	-3.10	H2
H2O(g)	-1.59	-0.00	1.59	H2O
Halite	-7.71	-6.14	1.56	NaCl
Hausmannite	-14.29	-4.14	10.14	Mn3O4
HCl(g)	-12.39	-6.08	6.30	HCl
Hematite	9.34	9.41	0.08	Fe2O3
Hercynite	-21.10	7.71	28.80	FeAl2O4
Hexahydrite	-4.32	-6.04	-1.73	MgSO4:6H2O
Hydrophilite	-20.70	-8.95	11.75	CaCl2
Ice	-0.14	-0.00	0.14	H2O
Jarosite	6.61	-2.81	-9.41	KFe3(SO4)2(OH)6
Jarosite-Na	2.66	-2.79	-5.45	NaFe3(SO4)2(OH)6
K	-69.62	1.36	70.98	K
K(g)	-80.22	1.36	81.58	K
K2O	-84.18	-0.14	84.04	K2O
K3H(SO4)2	-13.44	-17.07	-3.62	K3H(SO4)2
Kainite	-11.89	-12.20	-0.31	KMgClSO4:3H2O
KAl(SO4)2	-15.17	-11.90	3.27	KAl(SO4)2
Katoite	-59.24	19.70	78.94	Ca3Al2H12O12
Kieserite	-5.78	-6.04	-0.27	MgSO4:H2O
KMgCl3	-37.19	-15.94	21.25	KMgCl3
KMgCl3:2H2O	-29.90	-15.94	13.96	KMgCl3:2H2O
Lammerite	-9.13	-7.58	1.55	Cu3(AsO4)2
Lawrencite	-23.57	-14.51	9.05	FeCl2
Leonite	-10.50	-14.61	-4.11	K2Mg(SO4)2:4H2O
Lime	-29.35	3.22	32.57	CaO
Magnetite	-3.35	7.07	10.42	Fe3O4
Manganite	-3.05	-3.22	-0.16	MnO(OH)
Manganosite	-15.63	2.29	17.92	MnO
Mayenite	-385.19	108.96	494.15	Ca12Al14O33
Melanterite	-8.37	-10.77	-2.40	FeSO4:7H2O
Mercallite	-7.06	-8.50	-1.44	KHSO4
Mg	-117.28	5.24	122.52	Mg
Mg(g)	-137.00	5.24	142.25	Mg
Mg1.25SO4(OH)0.5:0.5H2O	-10.64	-5.45	5.20	Mg1.25SO4(OH)0.5:0.5H2O

Mg1.5SO4(OH)	-14.06	-4.85	9.21	Mg1.5SO4(OH)
MgCl2:2H2O	-22.52	-9.78	12.73	MgCl2:2H2O
MgCl2:4H2O	-17.09	-9.79	7.30	MgCl2:4H2O
MgCl2:H2O	-25.86	-9.78	16.07	MgCl2:H2O
MgOHCl	-19.59	-3.70	15.89	MgOHCl
MgSO4	-10.87	-6.04	4.83	MgSO4
Mirabilite	-7.39	-8.55	-1.15	Na2SO4:10H2O
Misenite	-48.48	-59.56	-11.08	K8H6(SO4)7
Mn	-77.79	5.15	82.93	Mn
Mn(OH)2(am)	-13.02	2.29	15.31	Mn(OH)2
Mn(OH)3	-9.56	-3.22	6.34	Mn(OH)3
MnCl2:2H2O	-13.88	-9.88	4.00	MnCl2:2H2O
MnCl2:4H2O	-12.63	-9.88	2.75	MnCl2:4H2O
MnCl2:H2O	-15.42	-9.88	5.54	MnCl2:H2O
MnO2(gamma)	-0.67	-16.79	-16.13	MnO2
MnSO4	-8.75	-6.14	2.61	MnSO4
Molysite	-27.02	-13.55	13.47	FeCl3
Na	-66.00	1.37	67.37	Na
Na(g)	-79.49	1.37	80.86	Na
Na2O	-67.53	-0.12	67.42	Na2O
Na3H(SO4)2	-16.14	-17.03	-0.89	Na3H(SO4)2
Na4Ca(SO4)3:2H2O	-16.40	-22.30	-5.89	Na4Ca(SO4)3:2H2O
NaFeO2	-15.24	4.65	19.88	NaFeO2
Nantokite	-14.18	-20.95	-6.77	CuCl
O2(g)	-2.82	-5.72	-2.89	O2
Oxychloride-Mg	-27.15	-1.32	25.83	Mg2Cl(OH)3:4H2O
Pentahydrate	-4.66	-6.04	-1.39	MgSO4:5H2O
Periclase	-18.94	2.38	21.33	MgO
Picromerite	-10.17	-14.61	-4.44	K2Mg(SO4)2:6H2O
Polyhalite	-10.72	-25.03	-14.31	K2MgCa2(SO4)4:2H2O
Portlandite	-19.33	3.22	22.55	Ca(OH)2
Pyrolusite	0.87	-16.79	-17.66	MnO2
Scacchite	-18.62	-9.88	8.74	MnCl2
Spinel	-25.17	12.44	37.61	Al2MgO4
Starkeyite	-5.04	-6.04	-1.00	MgSO4:4H2O
Sylvite	-6.98	-6.16	0.83	KCl
Syngenite	-6.18	-13.78	-7.60	K2Ca(SO4)2:H2O
Tachyhydrite	-45.67	-28.52	17.14	Mg2CaCl6:12H2O
Tenorite	-5.18	2.47	7.65	CuO
Thenardite	-8.19	-8.54	-0.36	Na2SO4
Todorokite	-9.35	-55.17	-45.82	Mn7O12:3H2O
Wustite	-13.88	-1.47	12.40	Fe.947O
Zincite	-9.36	1.84	11.20	ZnO
Zn	-64.09	4.70	68.79	Zn
Zn(ClO4)2:6H2O	-70.27	-64.64	5.63	Zn(ClO4)2:6H2O
Zn(g)	-80.71	4.70	85.41	Zn
Zn(OH)2(beta)	-10.09	1.84	11.93	Zn(OH)2
Zn(OH)2(epsilon)	-9.82	1.84	11.66	Zn(OH)2
Zn(OH)2(gamma)	-10.04	1.84	11.88	Zn(OH)2
Zn2(OH)3Cl	-17.69	-2.40	15.29	Zn2(OH)3Cl
Zn2SO4(OH)2	-12.32	-4.74	7.58	Zn2SO4(OH)2
Zn3(AsO4)2	-18.76	-9.44	9.31	Zn3(AsO4)2
Zn3O(SO4)2	-30.42	-11.33	19.09	Zn3O(SO4)2
ZnCl2	-17.40	-10.33	7.08	ZnCl2
ZnSO4	-10.12	-6.58	3.53	ZnSO4
ZnSO4:6H2O	-4.89	-6.58	-1.70	ZnSO4:6H2O
ZnSO4:7H2O	-4.71	-6.59	-1.88	ZnSO4:7H2O
ZnSO4:H2O	-6.03	-6.58	-0.55	ZnSO4:H2O

Initial solution 2.      Inter 3

-----Solution composition-----

Elements	Molality	Moles
Al	1.284e-003	1.284e-003
As	1.337e-007	1.337e-007

Ca	7.623e-003	7.623e-003
Cl	1.105e-003	1.105e-003
Cu	2.049e-006	2.049e-006
Fe	2.181e-004	2.181e-004
K	2.221e-004	2.221e-004
Mg	1.223e-003	1.223e-003
Mn	2.547e-004	2.547e-004
Na	2.843e-003	2.843e-003
S(6)	1.161e-002	1.161e-002
Zn	3.064e-007	3.064e-007

-----Description of solution-----

pH	=	2.290
pe	=	12.000
Activity of water	=	1.000
Ionic strength	=	3.680e-002
Mass of water (kg)	=	1.000e+000
Total alkalinity (eq/kg)	=	-7.977e-003
Total carbon (mol/kg)	=	0.000e+000
Total CO2 (mol/kg)	=	0.000e+000
Temperature (deg C)	=	25.000
Electrical balance (eq)	=	9.172e-003
Percent error, 100*(Cat- An )/(Cat+ An )	=	21.65
Iterations	=	8
Total H	=	1.110586e+002
Total O	=	5.557178e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	5.903e-003	5.129e-003	-2.229	-2.290	-0.061
OH-	2.252e-012	1.878e-012	-11.648	-11.726	-0.079
H2O	5.553e+001	9.995e-001	1.744	-0.000	0.000
Al	1.284e-003				
AlSO4+	5.907e-004	4.949e-004	-3.229	-3.305	-0.077
Al+3	5.446e-004	1.494e-004	-3.264	-3.826	-0.562
Al(SO4)2-	1.484e-004	1.244e-004	-3.828	-3.905	-0.077
AlOH+2	6.571e-007	3.262e-007	-6.182	-6.487	-0.304
Al2(OH)2+4	2.524e-010	1.730e-011	-9.598	-10.762	-1.164
Al(OH)2+	1.762e-010	1.476e-010	-9.754	-9.831	-0.077
HALO2	4.189e-014	4.189e-014	-13.378	-13.378	0.000
Al3(OH)4+5	3.800e-015	6.338e-017	-14.420	-16.198	-1.778
AlO2-	3.339e-018	2.798e-018	-17.476	-17.553	-0.077
NaAlO2	1.245e-021	1.245e-021	-20.905	-20.905	0.000
Al13O4(OH)24+7	0.000e+000	0.000e+000	-71.703	-75.189	-3.486
As(-3)	0.000e+000				
AsH3	0.000e+000	0.000e+000	-107.015	-107.015	0.000
As(3)	8.809e-017				
HAsO2	4.701e-017	4.701e-017	-16.328	-16.328	0.000
As(OH)3	4.108e-017	4.108e-017	-16.386	-16.386	0.000
H2AsO3-	5.847e-024	4.899e-024	-23.233	-23.310	-0.077
AsO2-	5.592e-024	4.686e-024	-23.252	-23.329	-0.077
AsO2OH-2	1.914e-032	9.333e-033	-31.718	-32.030	-0.312
As(5)	1.337e-007				
H2AsO4-	7.609e-008	6.375e-008	-7.119	-7.195	-0.077
H3AsO4	5.759e-008	5.759e-008	-7.240	-7.240	0.000
HAsO4-2	4.231e-012	2.064e-012	-11.374	-11.685	-0.312
AsO4-3	5.216e-021	1.032e-021	-20.283	-20.986	-0.704
Ca	7.623e-003				
Ca+2	6.115e-003	3.186e-003	-2.214	-2.497	-0.283
CaSO4	1.507e-003	1.507e-003	-2.822	-2.822	0.000
CaCl+	7.369e-007	6.174e-007	-6.133	-6.209	-0.077
CaCl2	6.641e-010	6.641e-010	-9.178	-9.178	0.000
CaOH+	1.047e-013	8.770e-014	-12.980	-13.057	-0.077



Cl(-1)	1.105e-003					
Cl-	1.102e-003	9.144e-004	-2.958	-3.039	-0.081	
HCl	1.053e-006	1.053e-006	-5.977	-5.977	0.000	
CaCl+	7.369e-007	6.174e-007	-6.133	-6.209	-0.077	
MgCl+	3.884e-007	3.254e-007	-6.411	-6.488	-0.077	
NaCl	3.748e-007	3.748e-007	-6.426	-6.426	0.000	
MnCl+	2.176e-007	1.823e-007	-6.662	-6.739	-0.077	
FeCl+	5.641e-008	4.726e-008	-7.249	-7.325	-0.077	
KCl	5.516e-009	5.516e-009	-8.258	-8.258	0.000	
CuCl+	2.296e-009	1.924e-009	-8.639	-8.716	-0.077	
FeCl+2	2.088e-009	1.036e-009	-8.680	-8.984	-0.304	
FeCl2+	9.157e-010	7.673e-010	-9.038	-9.115	-0.077	
CaCl2	6.641e-010	6.641e-010	-9.178	-9.178	0.000	
ZnCl+	2.159e-010	1.809e-010	-9.666	-9.743	-0.077	
CuCl2	9.263e-013	9.263e-013	-12.033	-12.033	0.000	
FeCl2	2.319e-013	2.319e-013	-12.635	-12.635	0.000	
ZnCl2	1.932e-013	1.932e-013	-12.714	-12.714	0.000	
MnCl3-	3.974e-014	3.329e-014	-13.401	-13.478	-0.077	
Zn(OH)Cl	6.029e-016	6.029e-016	-15.220	-15.220	0.000	
ZnCl3-	1.165e-016	9.758e-017	-15.934	-16.011	-0.077	
CuCl2-	2.784e-017	2.332e-017	-16.555	-16.632	-0.077	
ZnCl4-2	1.387e-018	6.763e-019	-17.858	-18.170	-0.312	
FeCl4-2	1.149e-018	5.603e-019	-17.940	-18.252	-0.312	
FeCl4-	9.205e-019	7.713e-019	-18.036	-18.113	-0.077	
CuCl3-2	2.809e-019	1.370e-019	-18.552	-18.863	-0.312	
CuCl4-2	2.980e-023	1.454e-023	-22.526	-22.838	-0.312	
Cl(1)	5.148e-028					
HClO	5.148e-028	5.148e-028	-27.288	-27.288	0.000	
ClO-	3.230e-033	2.707e-033	-32.491	-32.568	-0.077	
Cl(3)	0.000e+000					
HClO2	0.000e+000	0.000e+000	-54.111	-54.111	0.000	
ClO2-	0.000e+000	0.000e+000	-54.914	-54.991	-0.077	
Cl(5)	0.000e+000					
ClO3-	0.000e+000	0.000e+000	-63.483	-63.562	-0.079	
Cl(7)	0.000e+000					
ClO4-	0.000e+000	0.000e+000	-76.356	-76.435	-0.079	
ZnClO4+	0.000e+000	0.000e+000	-82.010	-82.087	-0.077	
Cu(1)	5.307e-016					
Cu+	5.025e-016	4.211e-016	-15.299	-15.376	-0.077	
CuCl2-	2.784e-017	2.332e-017	-16.555	-16.632	-0.077	
CuCl3-2	2.809e-019	1.370e-019	-18.552	-18.863	-0.312	
Cu(2)	2.049e-006					
Cu+2	1.476e-006	7.692e-007	-5.831	-6.114	-0.283	
CuSO4	5.704e-007	5.704e-007	-6.244	-6.244	0.000	
CuCl+	2.296e-009	1.924e-009	-8.639	-8.716	-0.077	
CuOH+	9.229e-012	7.732e-012	-11.035	-11.112	-0.077	
CuCl2	9.263e-013	9.263e-013	-12.033	-12.033	0.000	
CuCl4-2	2.980e-023	1.454e-023	-22.526	-22.838	-0.312	
CuO2-2	8.086e-037	3.944e-037	-36.092	-36.404	-0.312	
Fe(2)	1.726e-004					
Fe+2	1.362e-004	7.095e-005	-3.866	-4.149	-0.283	
FeSO4	3.640e-005	3.640e-005	-4.439	-4.439	0.000	
FeCl+	5.641e-008	4.726e-008	-7.249	-7.325	-0.077	
FeOH+	5.219e-012	4.373e-012	-11.282	-11.359	-0.077	
FeCl2	2.319e-013	2.319e-013	-12.635	-12.635	0.000	
FeCl4-2	1.149e-018	5.603e-019	-17.940	-18.252	-0.312	
Fe(OH)2	6.769e-021	6.769e-021	-20.169	-20.169	0.000	
Fe(OH)3-	6.268e-029	5.252e-029	-28.203	-28.280	-0.077	
Fe(OH)4-2	0.000e+000	0.000e+000	-40.678	-40.990	-0.312	
Fe(3)	4.544e-005					
Fe+3	2.480e-005	6.803e-006	-4.606	-5.167	-0.562	
FeOH+2	1.724e-005	8.560e-006	-4.763	-5.068	-0.304	
FeSO4+	2.543e-006	2.131e-006	-5.595	-5.671	-0.077	
Fe(OH)2+	6.593e-007	5.524e-007	-6.181	-6.258	-0.077	
Fe(SO4)2-	1.392e-007	1.166e-007	-6.856	-6.933	-0.077	
Fe2(OH)2+4	2.876e-008	1.972e-009	-7.541	-8.705	-1.164	
FeCl+2	2.088e-009	1.036e-009	-8.680	-8.984	-0.304	

	FeCl <sub>2</sub> +	9.157e-010	7.673e-010	-9.038	-9.115	-0.077
	Fe(OH) <sub>3</sub>	5.035e-011	5.035e-011	-10.298	-10.298	0.000
	Fe <sub>3</sub> (OH) <sub>4+5</sub>	1.365e-011	2.276e-013	-10.865	-12.643	-1.778
	Fe(OH) <sub>4-</sub>	2.942e-018	2.465e-018	-17.531	-17.608	-0.077
	FeCl <sub>4-</sub>	9.205e-019	7.713e-019	-18.036	-18.113	-0.077
H(0)		4.137e-032				
	H <sub>2</sub>	2.069e-032	2.087e-032	-31.684	-31.680	0.004
K		2.221e-004				
	K+	2.165e-004	1.797e-004	-3.665	-3.746	-0.081
	KSO <sub>4-</sub>	5.603e-006	4.694e-006	-5.252	-5.328	-0.077
	KHSO <sub>4</sub>	2.124e-008	2.124e-008	-7.673	-7.673	0.000
	KCl	5.516e-009	5.516e-009	-8.258	-8.258	0.000
	KOH	1.214e-016	1.214e-016	-15.916	-15.916	0.000
Mg		1.223e-003				
	Mg+2	8.282e-004	4.559e-004	-3.082	-3.341	-0.259
	MgSO <sub>4</sub>	3.941e-004	3.941e-004	-3.404	-3.404	0.000
	MgCl+	3.884e-007	3.254e-007	-6.411	-6.488	-0.077
	Mg <sub>4</sub> (OH) <sub>4+4</sub>	0.000e+000	0.000e+000	-42.792	-43.955	-1.164
Mn(2)		2.547e-004				
	Mn+2	1.797e-004	9.362e-005	-3.745	-4.029	-0.283
	MnSO <sub>4</sub>	7.478e-005	7.478e-005	-4.126	-4.126	0.000
	MnCl+	2.176e-007	1.823e-007	-6.662	-6.739	-0.077
	MnOH+	5.598e-013	4.690e-013	-12.252	-12.329	-0.077
	MnCl <sub>3-</sub>	3.974e-014	3.329e-014	-13.401	-13.478	-0.077
	Mn <sub>2</sub> OH+3	2.199e-016	4.705e-017	-15.658	-16.327	-0.670
	Mn(OH) <sub>2</sub>	2.244e-022	2.244e-022	-21.649	-21.649	0.000
	Mn <sub>2</sub> (OH) <sub>3+</sub>	9.749e-026	8.168e-026	-25.011	-25.088	-0.077
	Mn(OH) <sub>3-</sub>	4.895e-032	4.101e-032	-31.310	-31.387	-0.077
	Mn(OH) <sub>4-2</sub>	0.000e+000	0.000e+000	-42.858	-43.169	-0.312
Mn(3)		1.167e-017				
	Mn+3	1.167e-017	2.497e-018	-16.933	-17.603	-0.670
Mn(6)		0.000e+000				
	MnO <sub>4-2</sub>	0.000e+000	0.000e+000	-55.845	-56.156	-0.312
Mn(7)		0.000e+000				
	MnO <sub>4-</sub>	0.000e+000	0.000e+000	-53.434	-53.513	-0.079
Na		2.843e-003				
	Na+	2.783e-003	2.332e-003	-2.555	-2.632	-0.077
	NaSO <sub>4-</sub>	5.953e-005	4.988e-005	-4.225	-4.302	-0.077
	NaCl	3.748e-007	3.748e-007	-6.426	-6.426	0.000
	NaOH	7.555e-016	7.555e-016	-15.122	-15.122	0.000
	NaAlO <sub>2</sub>	1.245e-021	1.245e-021	-20.905	-20.905	0.000
O(0)		2.895e-029				
	O <sub>2</sub>	1.448e-029	1.460e-029	-28.839	-28.836	0.004
S(6)		1.161e-002				
	SO <sub>4-2</sub>	6.638e-003	3.237e-003	-2.178	-2.490	-0.312
	HSO <sub>4-</sub>	2.002e-003	1.677e-003	-2.699	-2.775	-0.077
	CaSO <sub>4</sub>	1.507e-003	1.507e-003	-2.822	-2.822	0.000
	AlSO <sub>4+</sub>	5.907e-004	4.949e-004	-3.229	-3.305	-0.077
	MgSO <sub>4</sub>	3.941e-004	3.941e-004	-3.404	-3.404	0.000
	Al(SO <sub>4</sub> ) <sub>2-</sub>	1.484e-004	1.244e-004	-3.828	-3.905	-0.077
	MnSO <sub>4</sub>	7.478e-005	7.478e-005	-4.126	-4.126	0.000
	NaSO <sub>4-</sub>	5.953e-005	4.988e-005	-4.225	-4.302	-0.077
	FeSO <sub>4</sub>	3.640e-005	3.640e-005	-4.439	-4.439	0.000
	KSO <sub>4-</sub>	5.603e-006	4.694e-006	-5.252	-5.328	-0.077
	FeSO <sub>4+</sub>	2.543e-006	2.131e-006	-5.595	-5.671	-0.077
	CuSO <sub>4</sub>	5.704e-007	5.704e-007	-6.244	-6.244	0.000
	Fe(SO <sub>4</sub> ) <sub>2-</sub>	1.392e-007	1.166e-007	-6.856	-6.933	-0.077
	ZnSO <sub>4</sub>	8.010e-008	8.010e-008	-7.096	-7.096	0.000
	KHSO <sub>4</sub>	2.124e-008	2.124e-008	-7.673	-7.673	0.000
	H <sub>2</sub> SO <sub>4</sub>	8.115e-009	8.115e-009	-8.091	-8.091	0.000
Zn		3.064e-007				
	Zn+2	2.260e-007	1.178e-007	-6.646	-6.929	-0.283
	ZnSO <sub>4</sub>	8.010e-008	8.010e-008	-7.096	-7.096	0.000
	ZnCl+	2.159e-010	1.809e-010	-9.666	-9.743	-0.077
	ZnCl <sub>2</sub>	1.932e-013	1.932e-013	-12.714	-12.714	0.000
	ZnOH+	3.004e-014	2.517e-014	-13.522	-13.599	-0.077
	Zn(OH)Cl	6.029e-016	6.029e-016	-15.220	-15.220	0.000

ZnCl3-	1.165e-016	9.758e-017	-15.934	-16.011	-0.077
ZnCl4-2	1.387e-018	6.763e-019	-17.858	-18.170	-0.312
Zn(OH)2	2.101e-020	2.101e-020	-19.678	-19.678	0.000
Zn(OH)3-	1.515e-029	1.269e-029	-28.820	-28.897	-0.077
Zn(OH)4-2	8.646e-040	4.216e-040	-39.063	-39.375	-0.312
ZnClO4+	0.000e+000	0.000e+000	-82.010	-82.087	-0.077

-----Saturation indices-----

Phase	SI	log IAP	log KT	
Al	-125.24	24.67	149.91	Al
Al(g)	-175.95	24.67	200.62	Al
Al2(SO4)3	-34.02	-15.12	18.90	Al2(SO4)3
Al2(SO4)3:6H2O	-16.68	-15.12	1.56	Al2(SO4)3:6H2O
Alum-K	-7.58	-12.55	-4.97	KAl(SO4)2:12H2O
Alunite	-5.99	-6.46	-0.47	KAl3(OH)6(SO4)2
Anhydrite	-0.64	-4.99	-4.35	CaSO4
Antarcticite	-12.67	-8.58	4.09	CaCl2:6H2O
Antlerite	-20.40	-11.67	8.73	Cu3(SO4)(OH)4
Aphthitalite	-14.96	-18.85	-3.89	NaK3(SO4)2
Arcanite	-8.14	-9.98	-1.84	K2SO4
Arsenolite	-31.36	-51.20	-19.84	As2O3
As	-46.66	-3.97	42.68	As
As2O5	-21.11	-18.97	2.14	As2O5
As4O6(cubi)	-62.57	-102.40	-39.82	As4O6
As4O6(mono)	-62.35	-102.40	-40.05	As4O6
Atacamite	-31.06	-16.79	14.26	Cu4Cl2(OH)6
Bassanite	-1.28	-4.99	-3.71	CaSO4:0.5H2O
Birnessite	-93.91	-179.45	-85.55	Mn8O14:5H2O
Bischofite	-13.81	-9.42	4.39	MgCl2:6H2O
Bixbyite	-20.50	-21.47	-0.96	Mn2O3
Bloedite	-11.11	-13.59	-2.48	Na2Mg(SO4)2:4H2O
Boehmite	-4.51	3.04	7.55	AlO2H
Brochantite	-28.63	-13.21	15.42	Cu4(SO4)(OH)6
Brucite	-15.04	1.24	16.28	Mg(OH)2
Ca	-123.33	16.50	139.83	Ca
Ca(g)	-148.57	16.50	165.07	Ca
Ca2Al2O5:8H2O	-49.32	10.25	59.57	Ca2Al2O5:8H2O
Ca2Cl2(OH)2:H2O	-32.78	-6.49	26.29	Ca2Cl2(OH)2:H2O
Ca3(AsO4)2	-30.52	-12.72	17.80	Ca3(AsO4)2
Ca3Al2O6	-100.69	12.34	113.03	Ca3Al2O6
Ca4Al2Fe2O10	-122.66	17.82	140.48	Ca4Al2Fe2O10
Ca4Al2O7:13H2O	-92.84	14.42	107.25	Ca4Al2O7:13H2O
Ca4Al2O7:19H2O	-89.27	14.42	103.68	Ca4Al2O7:19H2O
Ca4Cl2(OH)6:13H2O	-70.66	-2.33	68.33	Ca4Cl2(OH)6:13H2O
CaAl2O4	-38.74	8.17	46.91	CaAl2O4
CaAl2O4:10H2O	-29.83	8.17	37.99	CaAl2O4:10H2O
CaAl4O7	-54.33	14.26	68.59	CaAl4O7
Carnallite	-20.48	-16.20	4.27	KMgCl3:6H2O
CaSO4:0.5H2O(beta)	-1.45	-4.99	-3.54	CaSO4:0.5H2O
Chalcanthite	-5.98	-8.60	-2.63	CuSO4:5H2O
Chalcocyanite	-11.52	-8.60	2.91	CuSO4
Chloromagnesite	-31.23	-9.42	21.82	MgCl2
Cl2(g)	-28.07	-25.08	2.99	Cl2
Claudetite	-31.40	-51.20	-19.80	As2O3
Corundum	-12.20	6.09	18.29	Al2O3
Cu	-18.61	12.88	31.50	Cu
Cu(g)	-70.77	12.88	83.66	Cu
CuCl2	-15.91	-12.19	3.72	CuCl2
Cuprite	-24.26	-26.17	-1.91	Cu2O
Delafossite	-4.95	-11.38	-6.44	CuFeO2
Diaspore	-4.10	3.04	7.15	AlHO2
Epsomite	-3.87	-5.83	-1.96	MgSO4:7H2O
Ettringite	-65.09	-2.63	62.46	Ca6Al2(SO4)3(OH)12:26H2O
Fe	-44.17	14.85	59.02	Fe
Fe(OH)2	-13.46	0.43	13.89	Fe(OH)2

Fe(OH)3	-3.94	1.70	5.64	Fe(OH)3
Fe2(SO4)3	-20.85	-17.80	3.05	Fe2(SO4)3
FeO	-13.09	0.43	13.52	FeO
Ferrite-Ca	-16.01	5.49	21.50	CaFe2O4
Ferrite-Cu	-8.41	1.87	10.28	CuFe2O4
Ferrite-Dicalcium	-49.23	7.57	56.80	Ca2Fe2O5
Ferrite-Mg	-16.38	4.64	21.02	MgFe2O4
Ferrite-Zn	-10.64	1.06	11.70	ZnFe2O4
FeSO4	-9.25	-6.64	2.61	FeSO4
Gibbsite	-4.70	3.04	7.74	Al(OH)3
Glauberite	-7.27	-12.74	-5.47	Na2Ca(SO4)2
Goethite	1.17	1.70	0.53	FeOOH
Gypsum	-0.46	-4.99	-4.53	CaSO4:2H2O
H2(g)	-28.58	-31.68	-3.10	H2
H2O(g)	-1.59	-0.00	1.59	H2O
Halite	-7.23	-5.67	1.56	NaCl
Hausmannite	-31.06	-20.91	10.14	Mn3O4
HCl(g)	-11.63	-5.33	6.30	HCl
Hematite	3.33	3.40	0.08	Fe2O3
Hercynite	-22.28	6.52	28.80	FeAl2O4
Hexahydrite	-4.11	-5.83	-1.73	MgSO4:6H2O
Hydrophilite	-20.32	-8.57	11.75	CaCl2
Ice	-0.14	-0.00	0.14	H2O
Jarosite	-1.08	-10.49	-9.41	KFe3(SO4)2(OH)6
Jarosite-Na	-3.93	-9.38	-5.45	NaFe3(SO4)2(OH)6
K	-65.22	5.75	70.98	K
K(g)	-75.83	5.75	81.58	K
K2O	-86.95	-2.91	84.04	K2O
K3H(SO4)2	-14.88	-18.51	-3.62	K3H(SO4)2
Kainite	-12.30	-12.62	-0.31	KMgClSO4:3H2O
KAl(SO4)2	-15.82	-12.55	3.27	KAl(SO4)2
Katoite	-66.61	12.34	78.94	Ca3Al2H12O12
Kieserite	-5.56	-5.83	-0.27	MgSO4:H2O
KMgCl3	-37.45	-16.20	21.25	KMgCl3
KMgCl3:2H2O	-30.17	-16.20	13.96	KMgCl3:2H2O
Lammerite	-25.13	-23.57	1.55	Cu3(AsO4)2
Lawrencite	-19.28	-10.23	9.05	FeCl2
Leonite	-11.70	-15.81	-4.11	K2Mg(SO4)2:4H2O
Lime	-30.49	2.08	32.57	CaO
Magnetite	-6.58	3.84	10.42	Fe3O4
Manganite	-10.57	-10.73	-0.16	MnO(OH)
Manganosite	-17.36	0.55	17.92	MnO
Mayenite	-426.54	67.61	494.15	Ca12Al14O33
Melanterite	-4.24	-6.64	-2.40	FeSO4:7H2O
Mercallite	-7.09	-8.53	-1.44	KHSO4
Mg	-106.86	15.66	122.52	Mg
Mg(g)	-126.59	15.66	142.25	Mg
Mg1.25SO4(OH)0.5:0.5H2O	-10.72	-5.52	5.20	Mg1.25SO4(OH)0.5:0.5H2O
Mg1.5SO4(OH)	-14.42	-5.21	9.21	Mg1.5SO4(OH)
MgCl2:2H2O	-22.15	-9.42	12.73	MgCl2:2H2O
MgCl2:4H2O	-16.72	-9.42	7.30	MgCl2:4H2O
MgCl2:H2O	-25.49	-9.42	16.07	MgCl2:H2O
MgOHCl	-19.98	-4.09	15.89	MgOHCl
MgSO4	-10.66	-5.83	4.83	MgSO4
Mirabilite	-6.60	-7.76	-1.15	Na2SO4:10H2O
Misenite	-50.06	-61.13	-11.08	K8H6(SO4)7
Mn	-67.96	14.97	82.93	Mn
Mn(OH)2(am)	-14.76	0.55	15.31	Mn(OH)2
Mn(OH)3	-17.07	-10.73	6.34	Mn(OH)3
MnCl2:2H2O	-14.10	-10.11	4.00	MnCl2:2H2O
MnCl2:4H2O	-12.86	-10.11	2.75	MnCl2:4H2O
MnCl2:H2O	-15.65	-10.11	5.54	MnCl2:H2O
MnO2(gamma)	-13.97	-30.09	-16.13	MnO2
MnSO4	-9.13	-6.52	2.61	MnSO4
Molysite	-27.75	-14.28	13.47	FeCl3
Na	-60.50	6.87	67.37	Na
Na(g)	-73.99	6.87	80.86	Na

Na2O	-68.10	-0.68	67.42	Na2O
Na3H(SO4)2	-14.28	-15.17	-0.89	Na3H(SO4)2
Na4Ca(SO4)3:2H2O	-14.60	-20.50	-5.89	Na4Ca(SO4)3:2H2O
NaFeO2	-18.52	1.36	19.88	NaFeO2
Nantokite	-11.65	-18.41	-6.77	CuCl
O2(g)	-25.94	-28.84	-2.89	O2
Oxychloride-Mg	-28.68	-2.85	25.83	Mg2Cl(OH)3:4H2O
Pentahydrate	-4.44	-5.83	-1.39	MgSO4:5H2O
Periclase	-20.09	1.24	21.33	MgO
Picromerite	-11.37	-15.81	-4.44	K2Mg(SO4)2:6H2O
Polyhalite	-11.47	-25.79	-14.31	K2MgCa2(SO4)4:2H2O
Portlandite	-20.46	2.08	22.55	Ca(OH)2
Pyrolusite	-12.43	-30.09	-17.66	MnO2
Scacchite	-18.85	-10.11	8.74	MnCl2
Spinel	-30.28	7.33	37.61	Al2MgO4
Starkeyite	-4.83	-5.83	-1.00	MgSO4:4H2O
Sylvite	-7.61	-6.78	0.83	KCl
Syngenite	-7.37	-14.97	-7.60	K2Ca(SO4)2:H2O
Tachyhydrite	-44.56	-27.41	17.14	Mg2CaCl6:12H2O
Tenorite	-9.18	-1.53	7.65	CuO
Thenardite	-7.40	-7.75	-0.36	Na2SO4
Todorokite	-79.31	-125.13	-45.82	Mn7O12:3H2O
Wustite	-11.86	0.54	12.40	Fe.9470
Zincite	-13.55	-2.35	11.20	ZnO
Zn	-56.72	12.07	68.79	Zn
Zn(ClO4)2:6H2O	-165.43	-159.80	5.63	Zn(ClO4)2:6H2O
Zn(g)	-73.34	12.07	85.41	Zn
Zn(OH)2(beta)	-14.28	-2.35	11.93	Zn(OH)2
Zn(OH)2(epsilon)	-14.01	-2.35	11.66	Zn(OH)2
Zn(OH)2(gamma)	-14.23	-2.35	11.88	Zn(OH)2
Zn2(OH)3Cl	-25.32	-10.03	15.29	Zn2(OH)3Cl
Zn2SO4(OH)2	-19.35	-11.77	7.58	Zn2SO4(OH)2
Zn3(AsO4)2	-35.33	-26.02	9.31	Zn3(AsO4)2
Zn3O(SO4)2	-40.28	-21.19	19.09	Zn3O(SO4)2
ZnCl2	-20.09	-13.01	7.08	ZnCl2
ZnSO4	-12.95	-9.42	3.53	ZnSO4
ZnSO4:6H2O	-7.72	-9.42	-1.70	ZnSO4:6H2O
ZnSO4:7H2O	-7.54	-9.42	-1.88	ZnSO4:7H2O
ZnSO4:H2O	-8.87	-9.42	-0.55	ZnSO4:H2O

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Beginning of batch-reaction calculations.  
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Reaction step 1.

Using mix 1.

Mixture 1.

1.000e+000 Solution 1 Flujo 3  
3.000e+000 Solution 2 Inter 3

-----Solution composition-----

Elements	Molality	Moles
Al	1.164e-003	4.655e-003
As	1.287e-005	5.147e-005
Ca	6.497e-003	2.599e-002
Cl	1.117e-003	4.470e-003
Cu	1.627e-004	6.510e-004
Fe	3.497e-004	1.399e-003
K	3.908e-004	1.563e-003
Mg	1.055e-003	4.221e-003
Mn	3.016e-004	1.206e-003
Na	2.360e-003	9.440e-003

S	1.200e-002	4.801e-002
Zn	3.741e-005	1.497e-004

-----Description of solution-----

pH	=	2.407	Charge balance
pe	=	12.776	Adjusted to redox equilibrium
Activity of water	=	1.000	
Ionic strength	=	3.525e-002	
Mass of water (kg)	=	4.000e+000	
Total alkalinity (eq/kg)	=	-6.551e-003	
Total carbon (mol/kg)	=	0.000e+000	
Total CO2 (mol/kg)	=	0.000e+000	
Temperature (deg C)	=	25.000	
Electrical balance (eq)	=	1.698e-002	
Percent error, 100*(Cat- An )/(Cat+ An )	=	10.66	
Iterations	=	6	
Total H	=	4.442287e+002	
Total O	=	2.222943e+002	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	4.499e-003	3.916e-003	-2.347	-2.407	-0.060
OH-	2.940e-012	2.459e-012	-11.532	-11.609	-0.078
H2O	5.553e+001	9.995e-001	1.744	-0.000	0.000
Al	1.164e-003				
AlSO4+	5.562e-004	4.674e-004	-3.255	-3.330	-0.076
Al+3	4.499e-004	1.256e-004	-3.347	-3.901	-0.554
Al(SO4)2-	1.570e-004	1.319e-004	-3.804	-3.880	-0.076
AlOH+2	7.153e-007	3.592e-007	-6.146	-6.445	-0.299
Al2(OH)2+4	2.933e-010	2.098e-011	-9.533	-10.678	-1.145
Al(OH)2+	2.534e-010	2.129e-010	-9.596	-9.672	-0.076
HA1O2	7.912e-014	7.912e-014	-13.102	-13.102	0.000
Al3(OH)4+5	6.236e-015	1.109e-016	-14.205	-15.955	-1.750
AlO2-	8.236e-018	6.921e-018	-17.084	-17.160	-0.076
NaAlO2	2.557e-021	2.557e-021	-20.592	-20.592	0.000
Al13O4(OH)24+7	0.000e+000	0.000e+000	-68.987	-72.419	-3.432
As(-3)	0.000e+000				
AsH3	0.000e+000	0.000e+000	-112.247	-112.247	0.000
As(3)	1.181e-016				
HAsO2	6.302e-017	6.302e-017	-16.200	-16.200	0.000
As(OH)3	5.508e-017	5.508e-017	-16.259	-16.259	0.000
H2AsO3-	1.024e-023	8.602e-024	-22.990	-23.065	-0.076
AsO2-	9.790e-024	8.227e-024	-23.009	-23.085	-0.076
AsO2OH-2	4.347e-032	2.146e-032	-31.362	-31.668	-0.307
HAsS2	0.000e+000	0.000e+000	-185.013	-185.013	0.000
As(5)	1.287e-005				
H2AsO4-	8.146e-006	6.845e-006	-5.089	-5.165	-0.076
H3AsO4	4.722e-006	4.722e-006	-5.326	-5.326	0.000
HAsO4-2	5.877e-010	2.902e-010	-9.231	-9.537	-0.307
AsO4-3	9.343e-019	1.901e-019	-18.030	-18.721	-0.692
Ca	6.497e-003				
Ca+2	5.077e-003	2.672e-003	-2.294	-2.573	-0.279
CaSO4	1.419e-003	1.419e-003	-2.848	-2.848	0.000
CaCl+	6.255e-007	5.256e-007	-6.204	-6.279	-0.076
CaCl2	5.739e-010	5.739e-010	-9.241	-9.241	0.000
CaOH+	1.146e-013	9.633e-014	-12.941	-13.016	-0.076
Cl(-1)	1.117e-003				
Cl-	1.115e-003	9.282e-004	-2.953	-3.032	-0.080
HCl	8.164e-007	8.164e-007	-6.088	-6.088	0.000
CaCl+	6.255e-007	5.256e-007	-6.204	-6.279	-0.076
MgCl+	3.281e-007	2.757e-007	-6.484	-6.559	-0.076
NaCl	3.159e-007	3.159e-007	-6.500	-6.500	0.000
MnCl+	2.534e-007	2.129e-007	-6.596	-6.672	-0.076

CuCl+	1.797e-007	1.510e-007	-6.745	-6.821	-0.076
FeCl+	4.144e-008	3.483e-008	-7.383	-7.458	-0.076
ZnCl+	2.604e-008	2.189e-008	-7.584	-7.660	-0.076
KCl	9.855e-009	9.855e-009	-8.006	-8.006	0.000
FeCl+2	9.080e-009	4.560e-009	-8.042	-8.341	-0.299
FeCl2+	4.078e-009	3.427e-009	-8.390	-8.465	-0.076
CaCl2	5.739e-010	5.739e-010	-9.241	-9.241	0.000
CuCl2	7.382e-011	7.382e-011	-10.132	-10.132	0.000
ZnCl2	2.373e-011	2.373e-011	-10.625	-10.625	0.000
FeCl2	1.735e-013	1.735e-013	-12.761	-12.761	0.000
Zn(OH)Cl	9.551e-014	9.551e-014	-13.020	-13.020	0.000
MnCl3-	4.769e-014	4.008e-014	-13.322	-13.397	-0.076
ZnCl3-	1.448e-014	1.216e-014	-13.839	-13.915	-0.076
CuCl2-	3.704e-016	3.113e-016	-15.431	-15.507	-0.076
ZnCl4-2	1.734e-016	8.559e-017	-15.761	-16.068	-0.307
FeCl4-	4.224e-018	3.549e-018	-17.374	-17.450	-0.076
CuCl3-2	3.759e-018	1.856e-018	-17.425	-17.731	-0.307
FeCl4-2	8.748e-019	4.319e-019	-18.058	-18.365	-0.307
CuCl4-2	2.418e-021	1.194e-021	-20.617	-20.923	-0.307
Cl(1)	2.440e-026				
HClO	2.440e-026	2.440e-026	-25.613	-25.613	0.000
ClO-	1.999e-031	1.680e-031	-30.699	-30.775	-0.076
Cl(3)	0.000e+000				
HClO2	0.000e+000	0.000e+000	-50.649	-50.649	0.000
ClO2-	0.000e+000	0.000e+000	-51.336	-51.412	-0.076
Cl(5)	0.000e+000				
ClO3-	0.000e+000	0.000e+000	-58.119	-58.196	-0.078
Cl(7)	0.000e+000				
ClO4-	0.000e+000	0.000e+000	-69.205	-69.283	-0.078
ZnClO4+	0.000e+000	0.000e+000	-72.783	-72.859	-0.076
Cu(1)	6.864e-015				
Cu+	6.490e-015	5.453e-015	-14.188	-14.263	-0.076
CuCl2-	3.704e-016	3.113e-016	-15.431	-15.507	-0.076
CuCl3-2	3.759e-018	1.856e-018	-17.425	-17.731	-0.307
Cu(2)	1.627e-004				
Cu+2	1.130e-004	5.948e-005	-3.947	-4.226	-0.279
CuSO4	4.954e-005	4.954e-005	-4.305	-4.305	0.000
CuCl+	1.797e-007	1.510e-007	-6.745	-6.821	-0.076
CuOH+	9.319e-010	7.831e-010	-9.031	-9.106	-0.076
CuCl2	7.382e-011	7.382e-011	-10.132	-10.132	0.000
CuCl4-2	2.418e-021	1.194e-021	-20.617	-20.923	-0.307
CuO2-2	1.817e-034	8.972e-035	-33.741	-34.047	-0.307
Fe(2)	1.276e-004				
Fe+2	9.786e-005	5.150e-005	-4.009	-4.288	-0.279
FeSO4	2.967e-005	2.967e-005	-4.528	-4.528	0.000
FeCl+	4.144e-008	3.483e-008	-7.383	-7.458	-0.076
FeOH+	4.947e-012	4.157e-012	-11.306	-11.381	-0.076
FeCl2	1.735e-013	1.735e-013	-12.761	-12.761	0.000
FeCl4-2	8.748e-019	4.319e-019	-18.058	-18.365	-0.307
Fe(OH)2	8.428e-021	8.428e-021	-20.074	-20.074	0.000
Fe(OH)3-	1.019e-028	8.564e-029	-27.992	-28.067	-0.076
Fe(OH)4-2	0.000e+000	0.000e+000	-40.354	-40.660	-0.307
Fe(3)	2.221e-004				
Fe+3	1.056e-004	2.948e-005	-3.976	-4.530	-0.554
FeOH+2	9.674e-005	4.859e-005	-4.014	-4.313	-0.299
FeSO4+	1.234e-005	1.037e-005	-4.909	-4.984	-0.076
Fe(OH)2+	4.887e-006	4.106e-006	-5.311	-5.387	-0.076
Fe2(OH)2+4	8.880e-007	6.354e-008	-6.052	-7.197	-1.145
Fe(SO4)2-	7.585e-007	6.374e-007	-6.120	-6.196	-0.076
FeCl+2	9.080e-009	4.560e-009	-8.042	-8.341	-0.299
FeCl2+	4.078e-009	3.427e-009	-8.390	-8.465	-0.076
Fe3(OH)4+5	3.066e-009	5.451e-011	-8.513	-10.264	-1.750
Fe(OH)3	4.902e-010	4.902e-010	-9.310	-9.310	0.000
Fe(OH)4-	3.740e-017	3.143e-017	-16.427	-16.503	-0.076
FeCl4-	4.224e-018	3.549e-018	-17.374	-17.450	-0.076
H(0)	6.769e-034				
H2	3.384e-034	3.413e-034	-33.471	-33.467	0.004

K	3.908e-004					
K+	3.797e-004	3.162e-004	-3.421	-3.500	-0.080	
KSO4-	1.104e-005	9.278e-006	-4.957	-5.033	-0.076	
KHSO4	3.206e-008	3.206e-008	-7.494	-7.494	0.000	
KCl	9.855e-009	9.855e-009	-8.006	-8.006	0.000	
KOH	2.798e-016	2.798e-016	-15.553	-15.553	0.000	
Mg	1.055e-003					
Mg+2	6.855e-004	3.805e-004	-3.164	-3.420	-0.256	
MgSO4	3.694e-004	3.694e-004	-3.432	-3.432	0.000	
MgCl+	3.281e-007	2.757e-007	-6.484	-6.559	-0.076	
Mg4(OH)4+4	0.000e+000	0.000e+000	-42.655	-43.801	-1.145	
Mn(2)	3.016e-004					
Mn+2	2.047e-004	1.077e-004	-3.689	-3.968	-0.279	
MnSO4	9.664e-005	9.664e-005	-4.015	-4.015	0.000	
MnCl+	2.534e-007	2.129e-007	-6.596	-6.672	-0.076	
MnOH+	8.411e-013	7.068e-013	-12.075	-12.151	-0.076	
MnCl3-	4.769e-014	4.008e-014	-13.322	-13.397	-0.076	
Mn2OH+3	3.720e-016	8.159e-017	-15.430	-16.088	-0.659	
Mn(OH)2	4.428e-022	4.428e-022	-21.354	-21.354	0.000	
Mn2(OH)3+	2.891e-025	2.430e-025	-24.539	-24.614	-0.076	
Mn(OH)3-	1.262e-031	1.060e-031	-30.899	-30.975	-0.076	
Mn(OH)4-2	0.000e+000	0.000e+000	-42.333	-42.640	-0.307	
Mn(3)	7.822e-017					
Mn+3	7.822e-017	1.716e-017	-16.107	-16.766	-0.659	
Mn(6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-51.747	-52.054	-0.307	
Mn(7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-48.557	-48.634	-0.078	
Na	2.360e-003					
Na+	2.304e-003	1.936e-003	-2.637	-2.713	-0.076	
NaSO4-	5.535e-005	4.651e-005	-4.257	-4.332	-0.076	
NaCl	3.159e-007	3.159e-007	-6.500	-6.500	0.000	
NaOH	8.215e-016	8.215e-016	-15.085	-15.085	0.000	
NaAlO2	2.557e-021	2.557e-021	-20.592	-20.592	0.000	
O(0)	1.083e-025					
O2	5.414e-026	5.461e-026	-25.266	-25.263	0.004	
S(-2)	0.000e+000					
H2S	0.000e+000	0.000e+000	-88.001	-88.001	0.000	
HS-	0.000e+000	0.000e+000	-92.526	-92.604	-0.078	
S-2	0.000e+000	0.000e+000	-102.830	-103.122	-0.292	
S2-2	0.000e+000	0.000e+000	-164.274	-164.581	-0.307	
HAsS2	0.000e+000	0.000e+000	-185.013	-185.013	0.000	
S3-2	0.000e+000	0.000e+000	-225.774	-226.081	-0.307	
S4-2	0.000e+000	0.000e+000	-287.501	-287.807	-0.307	
S5-2	0.000e+000	0.000e+000	-349.444	-349.751	-0.307	
S(2)	0.000e+000					
S2O3-2	0.000e+000	0.000e+000	-92.335	-92.641	-0.307	
HS2O3-	0.000e+000	0.000e+000	-93.959	-94.034	-0.076	
S(3)	0.000e+000					
S2O4-2	0.000e+000	0.000e+000	-89.909	-90.201	-0.292	
S(4)	4.665e-032					
HSO3-	2.979e-032	2.504e-032	-31.526	-31.601	-0.076	
H2SO3	9.397e-033	9.397e-033	-32.027	-32.027	0.000	
SO2	7.464e-033	7.464e-033	-32.127	-32.127	0.000	
SO3-2	7.468e-037	3.751e-037	-36.127	-36.426	-0.299	
S2O6-2	0.000e+000	0.000e+000	-48.124	-48.430	-0.307	
S3O6-2	0.000e+000	0.000e+000	-112.106	-112.413	-0.307	
S4O6-2	0.000e+000	0.000e+000	-160.183	-160.490	-0.307	
S5O6-2	0.000e+000	0.000e+000	-237.139	-237.446	-0.307	
S(5)	0.000e+000					
S2O5-2	0.000e+000	0.000e+000	-67.726	-68.033	-0.307	
S(6)	1.200e-002					
SO4-2	7.364e-003	3.636e-003	-2.133	-2.439	-0.307	
HSO4-	1.711e-003	1.438e-003	-2.767	-2.842	-0.076	
CaSO4	1.419e-003	1.419e-003	-2.848	-2.848	0.000	
AlSO4+	5.562e-004	4.674e-004	-3.255	-3.330	-0.076	
MgSO4	3.694e-004	3.694e-004	-3.432	-3.432	0.000	



Al(SO4)2-	1.570e-004	1.319e-004	-3.804	-3.880	-0.076
MnSO4	9.664e-005	9.664e-005	-4.015	-4.015	0.000
NaSO4-	5.535e-005	4.651e-005	-4.257	-4.332	-0.076
CuSO4	4.954e-005	4.954e-005	-4.305	-4.305	0.000
FeSO4	2.967e-005	2.967e-005	-4.528	-4.528	0.000
FeSO4+	1.234e-005	1.037e-005	-4.909	-4.984	-0.076
KSO4-	1.104e-005	9.278e-006	-4.957	-5.033	-0.076
ZnSO4	1.072e-005	1.072e-005	-4.970	-4.970	0.000
Fe(SO4)2-	7.585e-007	6.374e-007	-6.120	-6.196	-0.076
KHSO4	3.206e-008	3.206e-008	-7.494	-7.494	0.000
H2SO4	5.314e-009	5.314e-009	-8.275	-8.275	0.000
S(7)	0.000e+000				
S2O8-2	0.000e+000	0.000e+000	-44.473	-44.779	-0.307
S(8)	2.173e-035				
HSO5-	2.173e-035	1.826e-035	-34.663	-34.739	-0.076
Zn	3.741e-005				
Zn+2	2.667e-005	1.403e-005	-4.574	-4.853	-0.279
ZnSO4	1.072e-005	1.072e-005	-4.970	-4.970	0.000
ZnCl+	2.604e-008	2.189e-008	-7.584	-7.660	-0.076
ZnCl2	2.373e-011	2.373e-011	-10.625	-10.625	0.000
ZnOH+	4.675e-012	3.928e-012	-11.330	-11.406	-0.076
Zn(OH)Cl	9.551e-014	9.551e-014	-13.020	-13.020	0.000
ZnCl3-	1.448e-014	1.216e-014	-13.839	-13.915	-0.076
ZnCl4-2	1.734e-016	8.559e-017	-15.761	-16.068	-0.307
Zn(OH)2	4.294e-018	4.294e-018	-17.367	-17.367	0.000
Zn(OH)3-	4.043e-027	3.397e-027	-26.393	-26.469	-0.076
Zn(OH)4-2	2.995e-037	1.478e-037	-36.524	-36.830	-0.307
ZnClO4+	0.000e+000	0.000e+000	-72.783	-72.859	-0.076

-----Saturation indices-----

Phase	SI	log IAP	log KT	
Al	-127.65	22.27	149.91	Al
Al(g)	-178.35	22.27	200.62	Al
Al2(SO4)3	-34.02	-15.12	18.90	Al2(SO4)3
Al2(SO4)3:6H2O	-16.68	-15.12	1.56	Al2(SO4)3:6H2O
Alabandite	-93.74	-94.16	-0.42	MnS
Alum-K	-7.31	-12.28	-4.97	KAl(SO4)2:12H2O
Alunite	-5.17	-5.64	-0.47	KAl3(OH)6(SO4)2
Anhydrite	-0.66	-5.01	-4.35	CaSO4
Antarcticite	-12.73	-8.64	4.09	CaCl2:6H2O
Antlerite	-14.22	-5.49	8.73	Cu3(SO4)(OH)4
Aphthitalite	-14.20	-18.09	-3.89	NaK3(SO4)2
Arcanite	-7.60	-9.44	-1.84	K2SO4
Arsenolite	-31.10	-50.94	-19.84	As2O3
Arsenopyrite	-148.90	-163.34	-14.45	FeAsS
As	-49.21	-6.53	42.68	As
As2O5	-17.28	-15.14	2.14	As2O5
As4O6(cubi)	-62.07	-101.89	-39.82	As4O6
As4O6(mono)	-61.84	-101.89	-40.05	As4O6
Atacamite	-22.79	-8.53	14.26	Cu4Cl2(OH)6
Bassanite	-1.31	-5.01	-3.71	CaSO4:0.5H2O
Birnessite	-80.83	-166.37	-85.55	Mn8O14:5H2O
Bischofite	-13.88	-9.49	4.39	MgCl2:6H2O
Bixbyite	-18.12	-19.09	-0.96	Mn2O3
Bloedite	-11.25	-13.73	-2.48	Na2Mg(SO4)2:4H2O
Boehmite	-4.23	3.32	7.55	AlO2H
Bornite	-323.82	-426.35	-102.53	Cu5FeS4
Brochantite	-20.32	-4.90	15.42	Cu4(SO4)(OH)6
Brucite	-14.89	1.39	16.28	Mg(OH)2
Ca	-124.96	14.87	139.83	Ca
Ca(g)	-150.20	14.87	165.07	Ca
Ca2Al2O5:8H2O	-48.45	11.12	59.57	Ca2Al2O5:8H2O
Ca2Cl2(OH)2:H2O	-32.69	-6.40	26.29	Ca2Cl2(OH)2:H2O
Ca3(AsO4)2	-26.22	-8.42	17.80	Ca3(AsO4)2
Ca3Al2O6	-99.67	13.36	113.03	Ca3Al2O6

Ca4Al2Fe2O10	-119.50	20.99	140.48	Ca4Al2Fe2O10
Ca4Al2O7:13H2O	-91.65	15.60	107.25	Ca4Al2O7:13H2O
Ca4Al2O7:19H2O	-88.08	15.60	103.68	Ca4Al2O7:19H2O
Ca4Cl2(OH)6:13H2O	-70.25	-1.92	68.33	Ca4Cl2(OH)6:13H2O
CaAl2O4	-38.03	8.88	46.91	CaAl2O4
CaAl2O4:10H2O	-29.12	8.88	37.99	CaAl2O4:10H2O
CaAl4O7	-53.07	15.52	68.59	CaAl4O7
Carnallite	-20.29	-16.02	4.27	KMgCl3:6H2O
CaSO4:0.5H2O(beta)	-1.48	-5.01	-3.54	CaSO4:0.5H2O
Chalcanthite	-4.04	-6.67	-2.63	CuSO4:5H2O
Chalcocite	-83.98	-118.72	-34.74	Cu2S
Chalcocyanite	-9.58	-6.67	2.91	CuSO4
Chalcopyrite	-156.30	-188.91	-32.60	CuFeS2
Chloromagnesite	-31.30	-9.48	21.82	MgCl2
Cl2(g)	-26.50	-23.51	2.99	Cl2
Claudetite	-31.15	-50.94	-19.80	As2O3
Corundum	-11.65	6.64	18.29	Al2O3
Covellite	-71.56	-94.42	-22.86	CuS
Cu	-18.28	13.22	31.50	Cu
Cu(g)	-70.44	13.22	83.66	Cu
CuCl2	-14.01	-10.29	3.72	CuCl2
Cuprite	-21.81	-23.71	-1.91	Cu2O
Delafossite	-2.73	-9.17	-6.44	CuFeO2
Diaspore	-3.83	3.32	7.15	AlHO2
Epsomite	-3.90	-5.86	-1.96	MgSO4:7H2O
Ettringite	-64.14	-1.68	62.46	Ca6Al2(SO4)3(OH)12:26H2O
Fe	-45.86	13.16	59.02	Fe
Fe(OH)2	-13.37	0.53	13.89	Fe(OH)2
Fe(OH)3	-2.95	2.69	5.64	Fe(OH)3
Fe2(SO4)3	-19.43	-16.38	3.05	Fe2(SO4)3
FeO	-13.00	0.53	13.52	FeO
Ferrite-Ca	-13.87	7.62	21.50	CaFe2O4
Ferrite-Cu	-4.31	5.97	10.28	CuFe2O4
Ferrite-Dicalcium	-46.94	9.86	56.80	Ca2Fe2O5
Ferrite-Mg	-14.24	6.78	21.02	MgFe2O4
Ferrite-Zn	-6.36	5.34	11.70	ZnFe2O4
FeSO4	-9.33	-6.73	2.61	FeSO4
Gibbsite	-4.42	3.32	7.74	Al(OH)3
Glauberite	-7.41	-12.88	-5.47	Na2Ca(SO4)2
Goethite	2.16	2.69	0.53	FeOOH
Gypsum	-0.48	-5.01	-4.53	CaSO4:2H2O
H2(g)	-30.37	-33.47	-3.10	H2
H2O(g)	-1.59	-0.00	1.59	H2O
H2S(g)	-87.02	-95.01	-7.99	H2S
Halite	-7.31	-5.75	1.56	NaCl
Hausmannite	-28.39	-18.24	10.14	Mn3O4
HCl(g)	-11.74	-5.44	6.30	HCl
Hematite	5.31	5.38	0.08	Fe2O3
Hercynite	-21.64	7.17	28.80	FeAl2O4
Hexahydrite	-4.13	-5.86	-1.73	MgSO4:6H2O
Hydrophilite	-20.38	-8.64	11.75	CaCl2
Ice	-0.14	-0.00	0.14	H2O
Jarosite	1.88	-7.53	-9.41	KFe3(SO4)2(OH)6
Jarosite-Na	-1.29	-6.74	-5.45	NaFe3(SO4)2(OH)6
K	-65.75	5.22	70.98	K
K(g)	-76.36	5.22	81.58	K
K2O	-86.22	-2.19	84.04	K2O
K3H(SO4)2	-14.16	-17.79	-3.62	K3H(SO4)2
Kainite	-12.08	-12.39	-0.31	KMgClSO4:3H2O
KAl(SO4)2	-15.55	-12.28	3.27	KAl(SO4)2
Katoite	-65.58	13.36	78.94	Ca3Al2H12O12
Kieserite	-5.59	-5.86	-0.27	MgSO4:H2O
KMgCl3	-37.26	-16.02	21.25	KMgCl3
KMgCl3:2H2O	-29.98	-16.02	13.96	KMgCl3:2H2O
Lammerite	-14.93	-13.38	1.55	Cu3(AsO4)2
Lawrencite	-19.41	-10.35	9.05	FeCl2
Leonite	-11.19	-15.30	-4.11	K2Mg(SO4)2:4H2O

Lime	-30.33	2.24	32.57	CaO
Magnetite	-4.51	5.91	10.42	Fe <sub>3</sub> O <sub>4</sub>
Manganite	-9.38	-9.54	-0.16	MnO(OH)
Manganosite	-17.07	0.85	17.92	MnO
Mayenite	-420.78	73.37	494.15	Ca <sub>12</sub> Al <sub>14</sub> O <sub>33</sub>
Melanterite	-4.33	-6.73	-2.40	FeSO <sub>4</sub> ·7H <sub>2</sub> O
Mercallite	-6.91	-8.35	-1.44	KHSO <sub>4</sub>
Mg	-108.49	14.03	122.52	Mg
Mg(g)	-128.22	14.03	142.25	Mg
Mg1.25SO <sub>4</sub> (OH)0.5:0.5H <sub>2</sub> O	-10.71	-5.51	5.20	Mg1.25SO <sub>4</sub> (OH)0.5:0.5H <sub>2</sub> O
Mg1.5SO <sub>4</sub> (OH)	-14.37	-5.16	9.21	Mg1.5SO <sub>4</sub> (OH)
MgCl <sub>2</sub> :2H <sub>2</sub> O	-22.22	-9.48	12.73	MgCl <sub>2</sub> :2H <sub>2</sub> O
MgCl <sub>2</sub> :4H <sub>2</sub> O	-16.79	-9.49	7.30	MgCl <sub>2</sub> :4H <sub>2</sub> O
MgCl <sub>2</sub> :H <sub>2</sub> O	-25.56	-9.48	16.07	MgCl <sub>2</sub> :H <sub>2</sub> O
MgOHCl	-19.94	-4.05	15.89	MgOHCl
MgSO <sub>4</sub>	-10.69	-5.86	4.83	MgSO <sub>4</sub>
Mirabilite	-6.71	-7.87	-1.15	Na <sub>2</sub> SO <sub>4</sub> :10H <sub>2</sub> O
Misenite	-48.44	-59.52	-11.08	K <sub>8</sub> H <sub>6</sub> (SO <sub>4</sub> ) <sub>7</sub>
Mn	-69.46	13.48	82.93	Mn
Mn(OH)2(am)	-14.46	0.85	15.31	Mn(OH) <sub>2</sub>
Mn(OH)3	-15.89	-9.54	6.34	Mn(OH) <sub>3</sub>
MnCl <sub>2</sub> :2H <sub>2</sub> O	-14.03	-10.03	4.00	MnCl <sub>2</sub> :2H <sub>2</sub> O
MnCl <sub>2</sub> :4H <sub>2</sub> O	-12.78	-10.03	2.75	MnCl <sub>2</sub> :4H <sub>2</sub> O
MnCl <sub>2</sub> :H <sub>2</sub> O	-15.57	-10.03	5.54	MnCl <sub>2</sub> :H <sub>2</sub> O
MnO <sub>2</sub> (gamma)	-11.88	-28.01	-16.13	MnO <sub>2</sub>
MnSO <sub>4</sub>	-9.02	-6.41	2.61	MnSO <sub>4</sub>
Molysite	-27.10	-13.63	13.47	FeCl <sub>3</sub>
Na	-61.36	6.01	67.37	Na
Na(g)	-74.85	6.01	80.86	Na
Na <sub>2</sub> O	-68.03	-0.61	67.42	Na <sub>2</sub> O
Na <sub>3</sub> H(SO <sub>4</sub> ) <sub>2</sub>	-14.53	-15.43	-0.89	Na <sub>3</sub> H(SO <sub>4</sub> ) <sub>2</sub>
Na <sub>4</sub> Ca(SO <sub>4</sub> ) <sub>3</sub> :2H <sub>2</sub> O	-14.85	-20.74	-5.89	Na <sub>4</sub> Ca(SO <sub>4</sub> ) <sub>3</sub> :2H <sub>2</sub> O
NaFeO <sub>2</sub>	-17.50	2.38	19.88	NaFeO <sub>2</sub>
Nantokite	-10.53	-17.30	-6.77	CuCl
O <sub>2</sub> (g)	-22.37	-25.26	-2.89	O <sub>2</sub>
Orpiment	-256.49	-335.98	-79.49	As <sub>2</sub> S <sub>3</sub>
Oxychloride-Mg	-28.48	-2.65	25.83	Mg <sub>2</sub> Cl(OH) <sub>3</sub> :4H <sub>2</sub> O
Pentahydrite	-4.47	-5.86	-1.39	MgSO <sub>4</sub> :5H <sub>2</sub> O
Periclase	-19.93	1.39	21.33	MgO
Picromerite	-10.86	-15.30	-4.44	K <sub>2</sub> Mg(SO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O
Polyhalite	-11.01	-25.32	-14.31	K <sub>2</sub> MgCa <sub>2</sub> (SO <sub>4</sub> ) <sub>4</sub> :2H <sub>2</sub> O
Portlandite	-20.31	2.24	22.55	Ca(OH) <sub>2</sub>
Pyrite	-142.86	-167.56	-24.70	FeS <sub>2</sub>
Pyrolusite	-10.35	-28.01	-17.66	MnO <sub>2</sub>
Pyrrhotite	-90.75	-94.48	-3.74	FeS
Realgar	-99.48	-159.75	-60.28	AsS
S	-62.53	-107.64	-45.11	S
S <sub>2</sub> (g)	-138.96	-146.14	-7.19	S <sub>2</sub>
Scacchite	-18.77	-10.03	8.74	MnCl <sub>2</sub>
SO <sub>2</sub> (g)	-32.30	-32.13	0.18	SO <sub>2</sub>
Sphalerite	-83.58	-95.05	-11.47	ZnS
Spinel	-29.57	8.03	37.61	Al <sub>2</sub> MgO <sub>4</sub>
Starkeyite	-4.86	-5.86	-1.00	MgSO <sub>4</sub> :4H <sub>2</sub> O
Sylvite	-7.36	-6.53	0.83	KCl
Syngenite	-6.85	-14.45	-7.60	K <sub>2</sub> Ca(SO <sub>4</sub> ) <sub>2</sub> :H <sub>2</sub> O
Tachyhydrite	-44.75	-27.61	17.14	Mg <sub>2</sub> CaCl <sub>6</sub> :12H <sub>2</sub> O
Tenorite	-7.06	0.59	7.65	CuO
Thenardite	-7.51	-7.87	-0.36	Na <sub>2</sub> SO <sub>4</sub>
Todorokite	-68.31	-114.14	-45.82	Mn <sub>7</sub> O <sub>12</sub> :3H <sub>2</sub> O
Troilite	-90.64	-94.48	-3.84	FeS
Wurtzite	-85.88	-95.05	-9.17	ZnS
Wustite	-11.68	0.73	12.40	Fe <sub>9</sub> 47O
Zincite	-11.24	-0.04	11.20	ZnO
Zn	-56.20	12.59	68.79	Zn
Zn(ClO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O	-149.05	-143.42	5.63	Zn(ClO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O
Zn(g)	-72.82	12.59	85.41	Zn
Zn(OH)2(beta)	-11.97	-0.04	11.93	Zn(OH) <sub>2</sub>

Zn(OH)2(epsilon)	-11.70	-0.04	11.66	Zn(OH)2
Zn(OH)2(gamma)	-11.92	-0.04	11.88	Zn(OH)2
Zn2(OH)3Cl	-20.81	-5.52	15.29	Zn2(OH)3Cl
Zn2SO4(OH)2	-14.91	-7.33	7.58	Zn2SO4(OH)2
Zn3(AsO4)2	-24.57	-15.26	9.31	Zn3(AsO4)2
Zn3O(SO4)2	-33.71	-14.62	19.09	Zn3O(SO4)2
ZnCl2	-18.00	-10.92	7.08	ZnCl2
ZnSO4	-10.83	-7.29	3.53	ZnSO4
ZnSO4:6H2O	-5.59	-7.29	-1.70	ZnSO4:6H2O
ZnSO4:7H2O	-5.42	-7.29	-1.88	ZnSO4:7H2O
ZnSO4:H2O	-6.74	-7.29	-0.55	ZnSO4:H2O

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End of simulation.  
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Reading input data for simulation 2.  
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End of run.  
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