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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 2  
temp 25  
pH 2.80  
pe 17  
redox pe  
units mg/l  
density 1  
Cl 45.3  
S(6) 947.3  
Al 8.4  
As 0.3  
Ca 34.9  
Cu 0.1  
Fe 43.4  
K 15.8  
Mg 11.5  
Mn 6.0  
Na 14.2  
Zn 1.5  
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      1
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 2

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

Elements	Molality	Moles
Al	3.117e-004	3.117e-004
As	4.009e-006	4.009e-006
Ca	8.718e-004	8.718e-004
Cl	1.279e-003	1.279e-003
Cu	1.575e-006	1.575e-006
Fe	7.780e-004	7.780e-004
K	4.046e-004	4.046e-004
Mg	4.737e-004	4.737e-004
Mn	1.093e-004	1.093e-004
Na	6.184e-004	6.184e-004
S(6)	9.875e-003	9.875e-003
Zn	2.297e-005	2.297e-005

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

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pH = 2.800
pe = 17.000
Activity of water = 1.000
Ionic strength = 2.333e-002
Mass of water (kg) = 1.000e+000
Total alkalinity (eq/kg) = -3.569e-003
Total carbon (mol/kg) = 0.000e+000
Total CO2 (mol/kg) = 0.000e+000
Temperature (deg C) = 25.000
Electrical balance (eq) = -1.177e-002
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -46.23
Iterations = 10
Total H = 1.110539e+002
Total O = 5.556546e+001

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

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	1.790e-003	1.585e-003	-2.747	-2.800	-0.053
OH-	7.066e-012	6.077e-012	-11.151	-11.216	-0.065
H2O	5.553e+001	9.997e-001	1.744	-0.000	0.000
Al	3.117e-004				
AlSO4+	1.622e-004	1.400e-004	-3.790	-3.854	-0.064
Al+3	9.218e-005	3.030e-005	-4.035	-4.519	-0.483
Al(SO4)2-	5.687e-005	4.907e-005	-4.245	-4.309	-0.064
AlOH+2	3.842e-007	2.141e-007	-6.415	-6.669	-0.254
Al(OH)2+	3.635e-010	3.136e-010	-9.440	-9.504	-0.064
Al2(OH)2+4	7.091e-011	7.454e-012	-10.149	-11.128	-0.978
HALO2	2.880e-013	2.880e-013	-12.541	-12.541	0.000
Al3(OH)4+5	1.833e-015	5.800e-017	-14.737	-16.237	-1.500
AlO2-	7.214e-017	6.224e-017	-16.142	-16.206	-0.064
NaAlO2	6.150e-021	6.150e-021	-20.211	-20.211	0.000
Al13O4(OH)24+7	0.000e+000	0.000e+000	-64.935	-67.875	-2.940

As(-3)	0.000e+000				
AsH3	0.000e+000	0.000e+000	-149.965	-149.965	0.000
As(3)	1.136e-026				
HAsO2	6.062e-027	6.062e-027	-26.217	-26.217	0.000
As(OH)3	5.299e-027	5.299e-027	-26.276	-26.276	0.000
H2AsO3-	2.370e-033	2.045e-033	-32.625	-32.689	-0.064
AsO2-	2.266e-033	1.955e-033	-32.645	-32.709	-0.064
AsO2OH-2	0.000e+000	0.000e+000	-40.640	-40.899	-0.259
As(5)	4.009e-006				
H2AsO4-	3.230e-006	2.787e-006	-5.491	-5.555	-0.064
H3AsO4	7.780e-007	7.780e-007	-6.109	-6.109	0.000
HAsO4-2	5.302e-010	2.919e-010	-9.276	-9.535	-0.259
AsO4-3	1.815e-018	4.725e-019	-17.741	-18.326	-0.584
Ca	8.718e-004				
Ca+2	6.315e-004	3.641e-004	-3.200	-3.439	-0.239
CaSO4	2.402e-004	2.402e-004	-3.619	-3.619	0.000
CaCl+	9.801e-008	8.456e-008	-7.009	-7.073	-0.064
CaCl2	1.090e-010	1.090e-010	-9.963	-9.963	0.000
CaOH+	3.760e-014	3.244e-014	-13.425	-13.489	-0.064
Cl(-1)	1.279e-003				
Cl-	1.278e-003	1.096e-003	-2.893	-2.960	-0.067
HCl	3.900e-007	3.900e-007	-6.409	-6.409	0.000
MgCl+	1.634e-007	1.410e-007	-6.787	-6.851	-0.064
MnCl+	1.037e-007	8.947e-008	-6.984	-7.048	-0.064
NaCl	9.975e-008	9.975e-008	-7.001	-7.001	0.000
CaCl+	9.801e-008	8.456e-008	-7.009	-7.073	-0.064
FeCl+2	2.048e-008	1.142e-008	-7.689	-7.942	-0.254
ZnCl+	1.825e-008	1.574e-008	-7.739	-7.803	-0.064
KCl	1.231e-008	1.231e-008	-7.910	-7.910	0.000
FeCl2+	1.174e-008	1.013e-008	-7.930	-7.995	-0.064
CuCl+	1.974e-009	1.703e-009	-8.705	-8.769	-0.064
CaCl2	1.090e-010	1.090e-010	-9.963	-9.963	0.000
ZnCl2	2.015e-011	2.015e-011	-10.696	-10.696	0.000
FeCl+	6.033e-012	5.206e-012	-11.219	-11.284	-0.064
CuCl2	9.828e-013	9.828e-013	-12.008	-12.008	0.000
Zn(OH)Cl	1.698e-013	1.698e-013	-12.770	-12.770	0.000
MnCl3-	2.720e-014	2.347e-014	-13.565	-13.630	-0.064
ZnCl3-	1.413e-014	1.219e-014	-13.850	-13.914	-0.064
ZnCl4-2	1.840e-016	1.013e-016	-15.735	-15.994	-0.259
FeCl2	3.061e-017	3.061e-017	-16.514	-16.514	0.000
FeCl4-	1.694e-017	1.462e-017	-16.771	-16.835	-0.064
CuCl2-	2.868e-022	2.474e-022	-21.542	-21.607	-0.064
FeCl4-2	1.929e-022	1.062e-022	-21.715	-21.974	-0.259
CuCl4-2	4.022e-023	2.214e-023	-22.396	-22.655	-0.259
CuCl3-2	3.163e-024	1.741e-024	-23.500	-23.759	-0.259
Cl(1)	1.997e-017				
HClO	1.997e-017	1.997e-017	-16.700	-16.700	0.000
ClO-	3.937e-022	3.397e-022	-21.405	-21.469	-0.064
Cl(3)	4.701e-033				
HClO2	3.145e-033	3.145e-033	-32.502	-32.502	0.000
ClO2-	1.556e-033	1.342e-033	-32.808	-32.872	-0.064
Cl(5)	4.389e-031				
ClO3-	4.389e-031	3.775e-031	-30.358	-30.423	-0.065
Cl(7)	6.162e-033				
ClO4-	6.161e-033	5.299e-033	-32.210	-32.276	-0.065
ZnClO4+	9.934e-037	8.571e-037	-36.003	-36.067	-0.064
Cu(1)	3.896e-021				
Cu+	3.606e-021	3.111e-021	-20.443	-20.507	-0.064
CuCl2-	2.868e-022	2.474e-022	-21.542	-21.607	-0.064
CuCl3-2	3.163e-024	1.741e-024	-23.500	-23.759	-0.259
Cu(2)	1.575e-006				
Cu+2	9.856e-007	5.683e-007	-6.006	-6.245	-0.239
CuSO4	5.878e-007	5.878e-007	-6.231	-6.231	0.000
CuCl+	1.974e-009	1.703e-009	-8.705	-8.769	-0.064
CuOH+	2.143e-011	1.849e-011	-10.669	-10.733	-0.064
CuCl2	9.828e-013	9.828e-013	-12.008	-12.008	0.000
CuCl4-2	4.022e-023	2.214e-023	-22.396	-22.655	-0.259

CuO2-2	5.806e-035	3.196e-035	-34.236	-34.495	-0.259
Fe(2)	1.598e-008				
Fe+2	1.131e-008	6.521e-009	-7.947	-8.186	-0.239
FeSO4	4.667e-009	4.667e-009	-8.331	-8.331	0.000
FeCl+	6.033e-012	5.206e-012	-11.219	-11.284	-0.064
FeOH+	1.508e-015	1.301e-015	-14.822	-14.886	-0.064
FeCl2	3.061e-017	3.061e-017	-16.514	-16.514	0.000
FeCl4-2	1.929e-022	1.062e-022	-21.715	-21.974	-0.259
Fe(OH)2	6.518e-024	6.518e-024	-23.186	-23.186	0.000
Fe(OH)3-	1.897e-031	1.637e-031	-30.722	-30.786	-0.064
Fe(OH)4-2	0.000e+000	0.000e+000	-42.727	-42.986	-0.259
Fe(3)	7.780e-004				
FeOH+2	4.569e-004	2.547e-004	-3.340	-3.594	-0.254
Fe+3	1.902e-004	6.253e-005	-3.721	-4.204	-0.483
Fe(OH)2+	6.165e-005	5.319e-005	-4.210	-4.274	-0.064
FeSO4+	3.166e-005	2.732e-005	-4.499	-4.564	-0.064
Fe2(OH)2+4	1.661e-005	1.745e-006	-4.780	-5.758	-0.978
Fe(SO4)2-	2.417e-006	2.085e-006	-5.617	-5.681	-0.064
Fe3(OH)4+5	6.129e-007	1.940e-008	-6.213	-7.712	-1.500
FeCl+2	2.048e-008	1.142e-008	-7.689	-7.942	-0.254
Fe(OH)3	1.569e-008	1.569e-008	-7.804	-7.804	0.000
FeCl2+	1.174e-008	1.013e-008	-7.930	-7.995	-0.064
Fe(OH)4-	2.882e-015	2.487e-015	-14.540	-14.604	-0.064
FeCl4-	1.694e-017	1.462e-017	-16.771	-16.835	-0.064
H(0)	0.000e+000				
H2	0.000e+000	0.000e+000	-42.703	-42.700	0.002
K	4.046e-004				
K+	3.904e-004	3.346e-004	-3.408	-3.475	-0.067
KSO4-	1.414e-005	1.220e-005	-4.850	-4.914	-0.064
KHSO4	1.705e-008	1.705e-008	-7.768	-7.768	0.000
KCl	1.231e-008	1.231e-008	-7.910	-7.910	0.000
KOH	7.319e-016	7.319e-016	-15.136	-15.136	0.000
Mg	4.737e-004				
Mg+2	2.748e-004	1.648e-004	-3.561	-3.783	-0.222
MgSO4	1.987e-004	1.987e-004	-3.702	-3.702	0.000
MgCl+	1.634e-007	1.410e-007	-6.787	-6.851	-0.064
Mg4(OH)4+4	0.000e+000	0.000e+000	-42.704	-43.682	-0.978
Mn(2)	1.093e-004				
Mn+2	6.651e-005	3.835e-005	-4.177	-4.416	-0.239
MnSO4	4.272e-005	4.272e-005	-4.369	-4.369	0.000
MnCl+	1.037e-007	8.947e-008	-6.984	-7.048	-0.064
MnOH+	7.206e-013	6.218e-013	-12.142	-12.206	-0.064
MnCl3-	2.720e-014	2.347e-014	-13.565	-13.630	-0.064
Mn2OH+3	9.297e-017	2.555e-017	-16.032	-16.593	-0.561
Mn(OH)2	9.628e-022	9.628e-022	-21.016	-21.016	0.000
Mn2(OH)3+	5.386e-025	4.647e-025	-24.269	-24.333	-0.064
Mn(OH)3-	6.602e-031	5.696e-031	-30.180	-30.244	-0.064
Mn(OH)4-2	0.000e+000	0.000e+000	-41.257	-41.517	-0.259
Mn(3)	3.722e-013				
Mn+3	3.722e-013	1.023e-013	-12.429	-12.990	-0.561
Mn(6)	6.246e-033				
MnO4-2	6.246e-033	3.439e-033	-32.204	-32.464	-0.259
Mn(7)	1.761e-025				
MnO4-	1.761e-025	1.514e-025	-24.754	-24.820	-0.065
Na	6.184e-004				
Na+	6.004e-004	5.180e-004	-3.222	-3.286	-0.064
NaSO4-	1.791e-005	1.545e-005	-4.747	-4.811	-0.064
NaCl	9.975e-008	9.975e-008	-7.001	-7.001	0.000
NaOH	5.431e-016	5.431e-016	-15.265	-15.265	0.000
NaAlO2	6.150e-021	6.150e-021	-20.211	-20.211	0.000
O(0)	3.186e-007				
O2	1.593e-007	1.602e-007	-6.798	-6.795	0.002
S(6)	9.875e-003				
SO4-2	8.202e-003	4.515e-003	-2.086	-2.345	-0.259
HSO4-	8.378e-004	7.229e-004	-3.077	-3.141	-0.064
CaSO4	2.402e-004	2.402e-004	-3.619	-3.619	0.000
MgSO4	1.987e-004	1.987e-004	-3.702	-3.702	0.000

AlSO4+	1.622e-004	1.400e-004	-3.790	-3.854	-0.064
Al(SO4)2-	5.687e-005	4.907e-005	-4.245	-4.309	-0.064
MnSO4	4.272e-005	4.272e-005	-4.369	-4.369	0.000
FeSO4+	3.166e-005	2.732e-005	-4.499	-4.564	-0.064
NaSO4-	1.791e-005	1.545e-005	-4.747	-4.811	-0.064
KSO4-	1.414e-005	1.220e-005	-4.850	-4.914	-0.064
ZnSO4	8.114e-006	8.114e-006	-5.091	-5.091	0.000
Fe(SO4)2-	2.417e-006	2.085e-006	-5.617	-5.681	-0.064
CuSO4	5.878e-007	5.878e-007	-6.231	-6.231	0.000
KHSO4	1.705e-008	1.705e-008	-7.768	-7.768	0.000
FeSO4	4.667e-009	4.667e-009	-8.331	-8.331	0.000
H2SO4	1.081e-009	1.081e-009	-8.966	-8.966	0.000
Zn	2.297e-005				
Zn+2	1.483e-005	8.552e-006	-4.829	-5.068	-0.239
ZnSO4	8.114e-006	8.114e-006	-5.091	-5.091	0.000
ZnCl+	1.825e-008	1.574e-008	-7.739	-7.803	-0.064
ZnCl2	2.015e-011	2.015e-011	-10.696	-10.696	0.000
ZnOH+	6.857e-012	5.916e-012	-11.164	-11.228	-0.064
Zn(OH)Cl	1.698e-013	1.698e-013	-12.770	-12.770	0.000
ZnCl3-	1.413e-014	1.219e-014	-13.850	-13.914	-0.064
ZnCl4-2	1.840e-016	1.013e-016	-15.735	-15.994	-0.259
Zn(OH)2	1.598e-017	1.598e-017	-16.796	-16.796	0.000
Zn(OH)3-	3.622e-026	3.125e-026	-25.441	-25.505	-0.064
Zn(OH)4-2	6.104e-036	3.361e-036	-35.214	-35.474	-0.259
ZnClO4+	9.934e-037	8.571e-037	-36.003	-36.067	-0.064

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

Phase	SI	log IAP	log KT	
Al	-140.94	8.98	149.91	Al
Al(g)	-191.64	8.98	200.62	Al
Al2(SO4)3	-34.97	-16.07	18.90	Al2(SO4)3
Al2(SO4)3:6H2O	-17.63	-16.07	1.56	Al2(SO4)3:6H2O
Alum-K	-7.72	-12.69	-4.97	KAl(SO4)2:12H2O
Alunite	-4.45	-4.92	-0.47	KAl3(OH)6(SO4)2
Anhydrite	-1.43	-5.78	-4.35	CaSO4
Antarcticite	-13.45	-9.36	4.09	CaCl2:6H2O
Antlerite	-18.61	-9.88	8.73	Cu3(SO4)(OH)4
Aphthitalite	-14.51	-18.40	-3.89	NaK3(SO4)2
Arcanite	-7.45	-9.30	-1.84	K2SO4
Arsenolite	-51.14	-70.98	-19.84	As2O3
As	-73.08	-30.39	42.68	As
As2O5	-18.84	-16.71	2.14	As2O5
As4O6(cubi)	-102.13	-141.96	-39.82	As4O6
As4O6(mono)	-101.91	-141.96	-40.05	As4O6
Atacamite	-28.37	-14.10	14.26	Cu4Cl2(OH)6
Bassanite	-2.08	-5.78	-3.71	CaSO4:0.5H2O
Birnessite	-22.73	-108.27	-85.55	Mn8O14:5H2O
Bischofite	-14.10	-9.70	4.39	MgCl2:6H2O
Bixbyite	-8.22	-9.18	-0.96	Mn2O3
Bloedite	-12.57	-15.05	-2.48	Na2Mg(SO4)2:4H2O
Boehmite	-3.67	3.88	7.55	AlO2H
Brochantite	-25.95	-10.53	15.42	Cu4(SO4)(OH)6
Brucite	-14.47	1.82	16.28	Mg(OH)2
Ca	-134.27	5.56	139.83	Ca
Ca(g)	-159.51	5.56	165.07	Ca
Ca2Al2O5:8H2O	-47.48	12.08	59.57	Ca2Al2O5:8H2O
Ca2Cl2(OH)2:H2O	-33.49	-7.20	26.29	Ca2Cl2(OH)2:H2O
Ca3(AsO4)2	-28.03	-10.23	17.80	Ca3(AsO4)2
Ca3Al2O6	-98.79	14.25	113.03	Ca3Al2O6
Ca4Al2Fe2O10	-115.68	24.80	140.48	Ca4Al2Fe2O10
Ca4Al2O7:13H2O	-90.85	16.41	107.25	Ca4Al2O7:13H2O
Ca4Al2O7:19H2O	-87.28	16.40	103.68	Ca4Al2O7:19H2O
Ca4Cl2(OH)6:13H2O	-71.21	-2.88	68.33	Ca4Cl2(OH)6:13H2O
CaAl2O4	-36.98	9.92	46.91	CaAl2O4
CaAl2O4:10H2O	-28.07	9.92	37.99	CaAl2O4:10H2O

CaAl4O7	-50.90	17.69	68.59	CaAl4O7
Carnallite	-20.41	-16.14	4.27	KMgCl3:6H2O
CaSO4:0.5H2O(beta)	-2.25	-5.78	-3.54	CaSO4:0.5H2O
Chalcanthite	-5.96	-8.59	-2.63	CuSO4:5H2O
Chalcocyanite	-11.50	-8.59	2.91	CuSO4
Chloromagnesite	-31.52	-9.70	21.82	MgCl2
Cl2(g)	-17.91	-14.92	2.99	Cl2
Claudetite	-51.18	-70.98	-19.80	As2O3
Corundum	-10.53	7.76	18.29	Al2O3
Cu	-28.74	2.75	31.50	Cu
Cu(g)	-80.90	2.75	83.66	Cu
CuCl2	-15.89	-12.17	3.72	CuCl2
Cuprite	-33.51	-35.41	-1.91	Cu2O
Delafoosite	-7.08	-13.51	-6.44	CuFeO2
Diaspore	-3.27	3.88	7.15	AlHO2
Epsomite	-4.17	-6.13	-1.96	MgSO4:7H2O
Ettringite	-65.57	-3.11	62.46	Ca6Al2(SO4)3(OH)12:26H2O
Fe	-58.21	0.81	59.02	Fe
Fe(OH)2	-16.48	-2.59	13.89	Fe(OH)2
Fe(OH)3	-1.44	4.20	5.64	Fe(OH)3
Fe2(SO4)3	-18.49	-15.44	3.05	Fe2(SO4)3
FeO	-16.11	-2.59	13.52	FeO
Ferrite-Ca	-10.94	10.55	21.50	CaFe2O4
Ferrite-Cu	-2.54	7.75	10.28	CuFe2O4
Ferrite-Dicalcium	-44.08	12.71	56.80	Ca2Fe2O5
Ferrite-Mg	-10.81	10.21	21.02	MgFe2O4
Ferrite-Zn	-2.78	8.92	11.70	ZnFe2O4
FeSO4	-13.14	-10.53	2.61	FeSO4
Gibbsite	-3.86	3.88	7.74	Al(OH)3
Glauberite	-9.23	-14.70	-5.47	Na2Ca(SO4)2
Goethite	3.67	4.20	0.53	FeOOH
Gypsum	-1.25	-5.78	-4.53	CaSO4:2H2O
H2(g)	-39.60	-42.70	-3.10	H2
H2O(g)	-1.59	-0.00	1.59	H2O
Halite	-7.81	-6.25	1.56	NaCl
Hausmannite	-18.14	-8.00	10.14	Mn3O4
HCl(g)	-12.06	-5.76	6.30	HCl
Hematite	8.32	8.39	0.08	Fe2O3
Hercynite	-23.63	5.18	28.80	FeAl2O4
Hexahydrite	-4.40	-6.13	-1.73	MgSO4:6H2O
Hydrophilite	-21.11	-9.36	11.75	CaCl2
Ice	-0.14	-0.00	0.14	H2O
Jarosite	5.43	-3.98	-9.41	KFe3(SO4)2(OH)6
Jarosite-Na	1.66	-3.79	-5.45	NaFe3(SO4)2(OH)6
K	-69.95	1.02	70.98	K
K(g)	-80.56	1.02	81.58	K
K2O	-85.39	-1.35	84.04	K2O
K3H(SO4)2	-14.29	-17.92	-3.62	K3H(SO4)2
Kainite	-12.25	-12.56	-0.31	KMgClSO4:3H2O
KAl(SO4)2	-15.96	-12.68	3.27	KAl(SO4)2
Katoite	-64.70	14.25	78.94	Ca3Al2H12O12
Kieserite	-5.86	-6.13	-0.27	MgSO4:H2O
KMgCl3	-37.39	-16.14	21.25	KMgCl3
KMgCl3:2H2O	-30.10	-16.14	13.96	KMgCl3:2H2O
Lammerite	-20.20	-18.65	1.55	Cu3(AsO4)2
Lawrencite	-23.16	-14.11	9.05	FeCl2
Leonite	-11.31	-15.42	-4.11	K2Mg(SO4)2:4H2O
Lime	-30.41	2.16	32.57	CaO
Magnetite	-4.61	5.81	10.42	Fe3O4
Manganite	-4.43	-4.59	-0.16	MnO(OH)
Manganosite	-16.73	1.18	17.92	MnO
Mayenite	-413.88	80.27	494.15	Ca12Al14O33
Melanterite	-8.13	-10.53	-2.40	FeSO4:7H2O
Mercallite	-7.18	-8.62	-1.44	KHSO4
Mg	-117.31	5.21	122.52	Mg
Mg(g)	-137.03	5.21	142.25	Mg
Mg1.25SO4(OH)0.5:0.5H2O	-10.87	-5.67	5.20	Mg1.25SO4(OH)0.5:0.5H2O

Mg1.5SO4(OH)	-14.43	-5.22	9.21	Mg1.5SO4(OH)
MgCl2:2H2O	-22.44	-9.70	12.73	MgCl2:2H2O
MgCl2:4H2O	-17.01	-9.70	7.30	MgCl2:4H2O
MgCl2:H2O	-25.78	-9.70	16.07	MgCl2:H2O
MgOHCl	-19.83	-3.94	15.89	MgOHCl
MgSO4	-10.96	-6.13	4.83	MgSO4
Mirabilite	-7.76	-8.92	-1.15	Na2SO4:10H2O
Misenite	-49.94	-61.02	-11.08	K8H6(SO4)7
Mn	-78.35	4.58	82.93	Mn
Mn(OH)2(am)	-14.12	1.18	15.31	Mn(OH)2
Mn(OH)3	-10.93	-4.59	6.34	Mn(OH)3
MnCl2:2H2O	-14.33	-10.34	4.00	MnCl2:2H2O
MnCl2:4H2O	-13.09	-10.34	2.75	MnCl2:4H2O
MnCl2:H2O	-15.88	-10.34	5.54	MnCl2:H2O
MnO2(gamma)	-2.31	-18.44	-16.13	MnO2
MnSO4	-9.37	-6.76	2.61	MnSO4
Molysite	-26.56	-13.08	13.47	FeCl3
Na	-66.16	1.21	67.37	Na
Na(g)	-79.65	1.21	80.86	Na
Na2O	-68.39	-0.97	67.42	Na2O
Na3H(SO4)2	-16.46	-17.35	-0.89	Na3H(SO4)2
Na4Ca(SO4)3:2H2O	-17.72	-23.62	-5.89	Na4Ca(SO4)3:2H2O
NaFeO2	-16.17	3.71	19.88	NaFeO2
Nantokite	-16.70	-23.47	-6.77	CuCl
O2(g)	-3.90	-6.80	-2.89	O2
Oxychloride-Mg	-27.96	-2.13	25.83	Mg2Cl(OH)3:4H2O
Pentahydrate	-4.74	-6.13	-1.39	MgSO4:5H2O
Periclase	-19.51	1.82	21.33	MgO
Picromerite	-10.99	-15.43	-4.44	K2Mg(SO4)2:6H2O
Polyhalite	-12.68	-26.99	-14.31	K2MgCa2(SO4)4:2H2O
Portlandite	-20.39	2.16	22.55	Ca(OH)2
Pyrolusite	-0.78	-18.44	-17.66	MnO2
Scacchite	-19.08	-10.34	8.74	MnCl2
Spinel	-28.03	9.58	37.61	Al2MgO4
Starkeyite	-5.13	-6.13	-1.00	MgSO4:4H2O
Sylvite	-7.26	-6.44	0.83	KCl
Syngenite	-7.48	-15.08	-7.60	K2Ca(SO4)2:H2O
Tachyhydrate	-45.91	-28.77	17.14	Mg2CaCl6:12H2O
Tenorite	-8.29	-0.65	7.65	CuO
Thenardite	-8.56	-8.92	-0.36	Na2SO4
Todorokite	-19.78	-65.61	-45.82	Mn7O12:3H2O
Wustite	-14.13	-1.73	12.40	Fe.9470
Zincite	-10.67	0.53	11.20	ZnO
Zn	-64.86	3.93	68.79	Zn
Zn(ClO4)2:6H2O	-75.25	-69.62	5.63	Zn(ClO4)2:6H2O
Zn(g)	-81.48	3.93	85.41	Zn
Zn(OH)2(beta)	-11.40	0.53	11.93	Zn(OH)2
Zn(OH)2(epsilon)	-11.13	0.53	11.66	Zn(OH)2
Zn(OH)2(gamma)	-11.35	0.53	11.88	Zn(OH)2
Zn2(OH)3Cl	-19.99	-4.70	15.29	Zn2(OH)3Cl
Zn2SO4(OH)2	-14.46	-6.88	7.58	Zn2SO4(OH)2
Zn3(AsO4)2	-24.43	-15.11	9.31	Zn3(AsO4)2
Zn3O(SO4)2	-33.38	-14.29	19.09	Zn3O(SO4)2
ZnCl2	-18.07	-10.99	7.08	ZnCl2
ZnSO4	-10.95	-7.41	3.53	ZnSO4
ZnSO4:6H2O	-5.71	-7.41	-1.70	ZnSO4:6H2O
ZnSO4:7H2O	-5.54	-7.41	-1.88	ZnSO4:7H2O
ZnSO4:H2O	-6.86	-7.41	-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 2  
1.000e+000 Solution 2 Inter 3

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

Elements	Molality	Moles
Al	7.981e-004	1.596e-003
As	2.071e-006	4.142e-006
Ca	4.247e-003	8.494e-003
Cl	1.192e-003	2.384e-003
Cu	1.812e-006	3.625e-006
Fe	4.980e-004	9.961e-004
K	3.133e-004	6.267e-004
Mg	8.482e-004	1.696e-003
Mn	1.820e-004	3.640e-004
Na	1.731e-003	3.462e-003

S	1.074e-002	2.148e-002
Zn	1.164e-005	2.327e-005

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

pH	=	2.486	Charge balance
pe	=	13.184	Adjusted to redox equilibrium
Activity of water	=	1.000	
Ionic strength	=	2.942e-002	
Mass of water (kg)	=	2.000e+000	
Total alkalinity (eq/kg)	=	-5.773e-003	
Total carbon (mol/kg)	=	0.000e+000	
Total CO2 (mol/kg)	=	0.000e+000	
Temperature (deg C)	=	25.000	
Electrical balance (eq)	=	-2.597e-003	
Percent error, 100*(Cat- An )/(Cat+ An )	=	-3.91	
Iterations	=	8	
Total H	=	2.221125e+002	
Total O	=	1.111372e+002	

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

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma
H+	3.723e-003	3.266e-003	-2.429	-2.486	-0.057
OH-	3.481e-012	2.949e-012	-11.458	-11.530	-0.072
H2O	5.553e+001	9.996e-001	1.744	-0.000	0.000
Al	7.981e-004				
AlSO4+	3.929e-004	3.341e-004	-3.406	-3.476	-0.070
Al+3	2.905e-004	8.722e-005	-3.537	-4.059	-0.522
Al(SO4)2-	1.142e-004	9.708e-005	-3.942	-4.013	-0.070
AlOH+2	5.682e-007	2.991e-007	-6.246	-6.524	-0.279
Al(OH)2+	2.500e-010	2.126e-010	-9.602	-9.672	-0.070
Al2(OH)2+4	1.709e-010	1.455e-011	-9.767	-10.837	-1.070
HA1O2	9.474e-014	9.474e-014	-13.023	-13.023	0.000
Al3(OH)4+5	3.329e-015	7.675e-017	-14.478	-16.115	-1.637
AlO2-	1.169e-017	9.939e-018	-16.932	-17.003	-0.070
NaAlO2	2.723e-021	2.723e-021	-20.565	-20.565	0.000
Al13O4(OH)24+7	0.000e+000	0.000e+000	-68.743	-71.953	-3.210
As(-3)	0.000e+000				
AsH3	0.000e+000	0.000e+000	-116.985	-116.985	0.000
As(3)	1.806e-018				
HAsO2	9.635e-019	9.635e-019	-18.016	-18.016	0.000
As(OH)3	8.421e-019	8.421e-019	-18.075	-18.075	0.000
H2AsO3-	1.854e-025	1.577e-025	-24.732	-24.802	-0.070
AsO2-	1.774e-025	1.508e-025	-24.751	-24.822	-0.070
AsO2OH-2	9.096e-034	4.718e-034	-33.041	-33.326	-0.285
HAsS2	0.000e+000	0.000e+000	-194.913	-194.913	0.000
As(5)	2.071e-006				
H2AsO4-	1.391e-006	1.183e-006	-5.857	-5.927	-0.070
H3AsO4	6.803e-007	6.803e-007	-6.167	-6.167	0.000
HAsO4-2	1.159e-010	6.012e-011	-9.936	-10.221	-0.285
AsO4-3	2.076e-019	4.723e-020	-18.683	-19.326	-0.643
Ca	4.247e-003				
Ca+2	3.267e-003	1.791e-003	-2.486	-2.747	-0.261
CaSO4	9.796e-004	9.796e-004	-3.009	-3.009	0.000
CaCl+	4.483e-007	3.812e-007	-6.348	-6.419	-0.070
CaCl2	4.502e-010	4.502e-010	-9.347	-9.347	0.000
CaOH+	9.109e-014	7.746e-014	-13.041	-13.111	-0.070
Cl(-1)	1.192e-003				
Cl-	1.190e-003	1.004e-003	-2.924	-2.998	-0.074
HCl	7.364e-007	7.364e-007	-6.133	-6.133	0.000
CaCl+	4.483e-007	3.812e-007	-6.348	-6.419	-0.070
MgCl+	2.852e-007	2.426e-007	-6.545	-6.615	-0.070
NaCl	2.534e-007	2.534e-007	-6.596	-6.596	0.000
MnCl+	1.664e-007	1.415e-007	-6.779	-6.849	-0.070

FeCl+	3.060e-008	2.602e-008	-7.514	-7.585	-0.070
FeCl+2	1.657e-008	8.721e-009	-7.781	-8.059	-0.279
ZnCl+	8.835e-009	7.513e-009	-8.054	-8.124	-0.070
KCl	8.652e-009	8.652e-009	-8.063	-8.063	0.000
FeCl2+	8.335e-009	7.088e-009	-8.079	-8.149	-0.070
CuCl+	2.180e-009	1.854e-009	-8.662	-8.732	-0.070
CaCl2	4.502e-010	4.502e-010	-9.347	-9.347	0.000
ZnCl2	8.811e-012	8.811e-012	-11.055	-11.055	0.000
CuCl2	9.802e-013	9.802e-013	-12.009	-12.009	0.000
FeCl2	1.402e-013	1.402e-013	-12.853	-12.853	0.000
Zn(OH)Cl	3.932e-014	3.932e-014	-13.405	-13.405	0.000
MnCl3-	3.664e-014	3.116e-014	-13.436	-13.506	-0.070
ZnCl3-	5.745e-015	4.885e-015	-14.241	-14.311	-0.070
ZnCl4-2	7.167e-017	3.718e-017	-16.145	-16.430	-0.285
FeCl4-	1.010e-017	8.590e-018	-16.996	-17.066	-0.070
CuCl2-	1.899e-018	1.615e-018	-17.722	-17.792	-0.070
FeCl4-2	7.871e-019	4.083e-019	-18.104	-18.389	-0.285
CuCl3-2	2.007e-020	1.041e-020	-19.697	-19.983	-0.285
CuCl4-2	3.574e-023	1.854e-023	-22.447	-22.732	-0.285
Cl(1)	2.074e-025				
HClO	2.074e-025	2.074e-025	-24.683	-24.683	0.000
ClO-	2.014e-030	1.712e-030	-29.696	-29.766	-0.070
Cl(3)	0.000e+000				
HClO2	0.000e+000	0.000e+000	-48.745	-48.745	0.000
ClO2-	0.000e+000	0.000e+000	-49.359	-49.429	-0.070
Cl(5)	0.000e+000				
ClO3-	0.000e+000	0.000e+000	-55.167	-55.240	-0.072
Cl(7)	0.000e+000				
ClO4-	0.000e+000	0.000e+000	-65.280	-65.352	-0.072
ZnClO4+	0.000e+000	0.000e+000	-69.356	-69.426	-0.070
Cu(1)	3.035e-017				
Cu+	2.843e-017	2.418e-017	-16.546	-16.617	-0.070
CuCl2-	1.899e-018	1.615e-018	-17.722	-17.792	-0.070
CuCl3-2	2.007e-020	1.041e-020	-19.697	-19.983	-0.285
Cu(2)	1.812e-006				
Cu+2	1.231e-006	6.751e-007	-5.910	-6.171	-0.261
CuSO4	5.789e-007	5.789e-007	-6.237	-6.237	0.000
CuCl+	2.180e-009	1.854e-009	-8.662	-8.732	-0.070
CuOH+	1.253e-011	1.066e-011	-10.902	-10.972	-0.070
CuCl2	9.802e-013	9.802e-013	-12.009	-12.009	0.000
CuCl4-2	3.574e-023	1.854e-023	-22.447	-22.732	-0.285
CuO2-2	4.060e-036	2.106e-036	-35.391	-35.677	-0.285
Fe(2)	8.601e-005				
Fe+2	6.488e-005	3.557e-005	-4.188	-4.449	-0.261
FeSO4	2.111e-005	2.111e-005	-4.676	-4.676	0.000
FeCl+	3.060e-008	2.602e-008	-7.514	-7.585	-0.070
FeOH+	4.049e-012	3.444e-012	-11.393	-11.463	-0.070
FeCl2	1.402e-013	1.402e-013	-12.853	-12.853	0.000
FeCl4-2	7.871e-019	4.083e-019	-18.104	-18.389	-0.285
Fe(OH)2	8.373e-021	8.373e-021	-20.077	-20.077	0.000
Fe(OH)3-	1.200e-028	1.020e-028	-27.921	-27.991	-0.070
Fe(OH)4-2	0.000e+000	0.000e+000	-40.220	-40.505	-0.285
Fe(3)	4.120e-004				
FeOH+2	1.957e-004	1.030e-004	-3.708	-3.987	-0.279
Fe+3	1.736e-004	5.213e-005	-3.760	-4.283	-0.522
FeSO4+	2.220e-005	1.888e-005	-4.654	-4.724	-0.070
Fe(OH)2+	1.228e-005	1.044e-005	-4.911	-4.981	-0.070
Fe2(OH)2+4	3.357e-006	2.857e-007	-5.474	-6.544	-1.070
Fe(SO4)2-	1.405e-006	1.195e-006	-5.852	-5.923	-0.070
Fe3(OH)4+5	2.705e-008	6.235e-010	-7.568	-9.205	-1.637
FeCl+2	1.657e-008	8.721e-009	-7.781	-8.059	-0.279
FeCl2+	8.335e-009	7.088e-009	-8.079	-8.149	-0.070
Fe(OH)3	1.495e-009	1.495e-009	-8.825	-8.825	0.000
Fe(OH)4-	1.352e-016	1.150e-016	-15.869	-15.939	-0.070
FeCl4-	1.010e-017	8.590e-018	-16.996	-17.066	-0.070
H(0)	7.193e-035				
H2	3.597e-035	3.622e-035	-34.444	-34.441	0.003

K	3.133e-004					
K+	3.042e-004	2.566e-004	-3.517	-3.591	-0.074	
KSO4-	9.118e-006	7.754e-006	-5.040	-5.110	-0.070	
KHSO4	2.234e-008	2.234e-008	-7.651	-7.651	0.000	
KCl	8.652e-009	8.652e-009	-8.063	-8.063	0.000	
KOH	2.724e-016	2.724e-016	-15.565	-15.565	0.000	
Mg	8.482e-004					
Mg+2	5.385e-004	3.095e-004	-3.269	-3.509	-0.241	
MgSO4	3.094e-004	3.094e-004	-3.510	-3.510	0.000	
MgCl+	2.852e-007	2.426e-007	-6.545	-6.615	-0.070	
Mg4(OH)4+4	0.000e+000	0.000e+000	-42.774	-43.844	-1.070	
Mn(2)	1.820e-004					
Mn+2	1.207e-004	6.619e-005	-3.918	-4.179	-0.261	
MnSO4	6.114e-005	6.114e-005	-4.214	-4.214	0.000	
MnCl+	1.664e-007	1.415e-007	-6.779	-6.849	-0.070	
MnOH+	6.124e-013	5.208e-013	-12.213	-12.283	-0.070	
MnCl3-	3.664e-014	3.116e-014	-13.436	-13.506	-0.070	
Mn2OH+3	1.521e-016	3.694e-017	-15.818	-16.433	-0.615	
Mn(OH)2	3.913e-022	3.913e-022	-21.407	-21.407	0.000	
Mn2(OH)3+	1.860e-025	1.582e-025	-24.730	-24.801	-0.070	
Mn(OH)3-	1.321e-031	1.124e-031	-30.879	-30.949	-0.070	
Mn(OH)4-2	0.000e+000	0.000e+000	-42.251	-42.536	-0.285	
Mn(3)	1.111e-016					
Mn+3	1.111e-016	2.699e-017	-15.954	-16.569	-0.615	
Mn(6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-49.716	-50.001	-0.285	
Mn(7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-46.101	-46.173	-0.072	
Na	1.731e-003					
Na+	1.689e-003	1.436e-003	-2.772	-2.843	-0.070	
NaSO4-	4.177e-005	3.552e-005	-4.379	-4.450	-0.070	
NaCl	2.534e-007	2.534e-007	-6.596	-6.596	0.000	
NaOH	7.308e-016	7.308e-016	-15.136	-15.136	0.000	
NaAlO2	2.723e-021	2.723e-021	-20.565	-20.565	0.000	
O(0)	9.631e-024					
O2	4.815e-024	4.850e-024	-23.317	-23.314	0.003	
S(-2)	0.000e+000					
H2S	0.000e+000	0.000e+000	-92.043	-92.043	0.000	
HS-	0.000e+000	0.000e+000	-96.495	-96.567	-0.072	
S-2	0.000e+000	0.000e+000	-106.734	-107.007	-0.272	
S2-2	0.000e+000	0.000e+000	-171.248	-171.533	-0.285	
HAsS2	0.000e+000	0.000e+000	-194.913	-194.913	0.000	
S3-2	0.000e+000	0.000e+000	-235.815	-236.101	-0.285	
S4-2	0.000e+000	0.000e+000	-300.610	-300.895	-0.285	
S5-2	0.000e+000	0.000e+000	-365.622	-365.907	-0.285	
S(2)	0.000e+000					
S2O3-2	0.000e+000	0.000e+000	-96.385	-96.671	-0.285	
HS2O3-	0.000e+000	0.000e+000	-98.072	-98.143	-0.070	
S(3)	0.000e+000					
S2O4-2	0.000e+000	0.000e+000	-92.984	-93.256	-0.272	
S(4)	3.963e-033					
HSO3-	2.682e-033	2.281e-033	-32.572	-32.642	-0.070	
H2SO3	7.140e-034	7.140e-034	-33.146	-33.146	0.000	
SO2	5.670e-034	5.670e-034	-33.246	-33.246	0.000	
SO3-2	7.784e-038	4.098e-038	-37.109	-37.387	-0.279	
S2O6-2	0.000e+000	0.000e+000	-49.252	-49.537	-0.285	
S3O6-2	0.000e+000	0.000e+000	-116.302	-116.587	-0.285	
S4O6-2	0.000e+000	0.000e+000	-167.447	-167.732	-0.285	
S5O6-2	0.000e+000	0.000e+000	-247.471	-247.756	-0.285	
S(5)	0.000e+000					
S2O5-2	0.000e+000	0.000e+000	-69.829	-70.114	-0.285	
S(6)	1.074e-002					
SO4-2	7.217e-003	3.743e-003	-2.142	-2.427	-0.285	
HSO4-	1.452e-003	1.235e-003	-2.838	-2.908	-0.070	
CaSO4	9.796e-004	9.796e-004	-3.009	-3.009	0.000	
AlSO4+	3.929e-004	3.341e-004	-3.406	-3.476	-0.070	
MgSO4	3.094e-004	3.094e-004	-3.510	-3.510	0.000	

Al(SO4)2-	1.142e-004	9.708e-005	-3.942	-4.013	-0.070
MnSO4	6.114e-005	6.114e-005	-4.214	-4.214	0.000
NaSO4-	4.177e-005	3.552e-005	-4.379	-4.450	-0.070
FeSO4+	2.220e-005	1.888e-005	-4.654	-4.724	-0.070
FeSO4	2.111e-005	2.111e-005	-4.676	-4.676	0.000
KSO4-	9.118e-006	7.754e-006	-5.040	-5.110	-0.070
ZnSO4	3.504e-006	3.504e-006	-5.455	-5.455	0.000
Fe(SO4)2-	1.405e-006	1.195e-006	-5.852	-5.923	-0.070
CuSO4	5.789e-007	5.789e-007	-6.237	-6.237	0.000
KHSO4	2.234e-008	2.234e-008	-7.651	-7.651	0.000
H2SO4	3.804e-009	3.804e-009	-8.420	-8.420	0.000
S(7)	0.000e+000				
S2O8-2	0.000e+000	0.000e+000	-43.653	-43.938	-0.285
S(8)	1.737e-034				
HSO5-	1.737e-034	1.477e-034	-33.760	-33.831	-0.070
Zn	1.164e-005				
Zn+2	8.123e-006	4.454e-006	-5.090	-5.351	-0.261
ZnSO4	3.504e-006	3.504e-006	-5.455	-5.455	0.000
ZnCl+	8.835e-009	7.513e-009	-8.054	-8.124	-0.070
ZnCl2	8.811e-012	8.811e-012	-11.055	-11.055	0.000
ZnOH+	1.758e-012	1.495e-012	-11.755	-11.825	-0.070
Zn(OH)Cl	3.932e-014	3.932e-014	-13.405	-13.405	0.000
ZnCl3-	5.745e-015	4.885e-015	-14.241	-14.311	-0.070
ZnCl4-2	7.167e-017	3.718e-017	-16.145	-16.430	-0.285
Zn(OH)2	1.960e-018	1.960e-018	-17.708	-17.708	0.000
Zn(OH)3-	2.187e-027	1.860e-027	-26.660	-26.731	-0.070
Zn(OH)4-2	1.871e-037	9.706e-038	-36.728	-37.013	-0.285
ZnClO4+	0.000e+000	0.000e+000	-69.356	-69.426	-0.070

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

Phase	SI	log IAP	log KT	
Al	-129.03	20.88	149.91	Al
Al(g)	-179.73	20.88	200.62	Al
Al2(SO4)3	-34.30	-15.40	18.90	Al2(SO4)3
Al2(SO4)3:6H2O	-16.96	-15.40	1.56	Al2(SO4)3:6H2O
Alabandite	-97.84	-98.26	-0.42	MnS
Alum-K	-7.53	-12.51	-4.97	KAl(SO4)2:12H2O
Alunite	-5.24	-5.71	-0.47	KAl3(OH)6(SO4)2
Anhydrite	-0.82	-5.17	-4.35	CaSO4
Antarcticite	-12.84	-8.74	4.09	CaCl2:6H2O
Antlerite	-19.73	-11.00	8.73	Cu3(SO4)(OH)4
Aphthitalite	-14.58	-18.47	-3.89	NaK3(SO4)2
Arcanite	-7.76	-9.61	-1.84	K2SO4
Arsenolite	-34.73	-54.58	-19.84	As2O3
Arsenopyrite	-156.22	-170.67	-14.45	FeAsS
As	-52.48	-9.80	42.68	As
As2O5	-18.96	-16.83	2.14	As2O5
As4O6(cubi)	-69.33	-109.15	-39.82	As4O6
As4O6(mono)	-69.10	-109.15	-40.05	As4O6
Atacamite	-30.03	-15.76	14.26	Cu4Cl2(OH)6
Bassanite	-1.47	-5.17	-3.71	CaSO4:0.5H2O
Birnessite	-75.41	-160.96	-85.55	Mn8O14:5H2O
Bischofite	-13.90	-9.51	4.39	MgCl2:6H2O
Bixbyite	-17.26	-18.22	-0.96	Mn2O3
Bloedite	-11.57	-14.05	-2.48	Na2Mg(SO4)2:4H2O
Boehmite	-4.15	3.40	7.55	AlO2H
Bornite	-350.88	-453.41	-102.53	Cu5FeS4
Brochantite	-27.62	-12.19	15.42	Cu4(SO4)(OH)6
Brucite	-14.82	1.46	16.28	Mg(OH)2
Ca	-125.95	13.88	139.83	Ca
Ca(g)	-151.19	13.88	165.07	Ca
Ca2Al2O5:8H2O	-48.32	11.25	59.57	Ca2Al2O5:8H2O
Ca2Cl2(OH)2:H2O	-32.81	-6.52	26.29	Ca2Cl2(OH)2:H2O
Ca3(AsO4)2	-27.95	-10.15	17.80	Ca3(AsO4)2
Ca3Al2O6	-99.56	13.47	113.03	Ca3Al2O6

Ca4Al2Fe2O10	-118.44	22.05	140.48	Ca4Al2Fe2O10
Ca4Al2O7:13H2O	-91.56	15.70	107.25	Ca4Al2O7:13H2O
Ca4Al2O7:19H2O	-87.99	15.69	103.68	Ca4Al2O7:19H2O
Ca4Cl2(OH)6:13H2O	-70.40	-2.07	68.33	Ca4Cl2(OH)6:13H2O
CaAl2O4	-37.89	9.02	46.91	CaAl2O4
CaAl2O4:10H2O	-28.97	9.02	37.99	CaAl2O4:10H2O
CaAl4O7	-52.77	15.82	68.59	CaAl4O7
Carnallite	-20.37	-16.10	4.27	KMgCl3:6H2O
CaSO4:0.5H2O(beta)	-1.64	-5.17	-3.54	CaSO4:0.5H2O
Chalcanthite	-5.97	-8.60	-2.63	CuSO4:5H2O
Chalcocite	-92.57	-127.31	-34.74	Cu2S
Chalcocyanite	-11.51	-8.60	2.91	CuSO4
Chalcopyrite	-166.18	-198.78	-32.60	CuFeS2
Chloromagnesite	-31.32	-9.51	21.82	MgCl2
Cl2(g)	-25.62	-22.63	2.99	Cl2
Claudetite	-34.78	-54.58	-19.80	As2O3
Corundum	-11.49	6.80	18.29	Al2O3
Covellite	-77.39	-100.25	-22.86	CuS
Cu	-21.04	10.46	31.50	Cu
Cu(g)	-73.20	10.46	83.66	Cu
CuCl2	-15.89	-12.17	3.72	CuCl2
Cuprite	-26.35	-28.26	-1.91	Cu2O
Delafossite	-4.52	-10.96	-6.44	CuFeO2
Diaspore	-3.75	3.40	7.15	AlHO2
Epsomite	-3.97	-5.94	-1.96	MgSO4:7H2O
Ettringite	-64.52	-2.05	62.46	Ca6Al2(SO4)3(OH)12:26H2O
Fe	-46.84	12.18	59.02	Fe
Fe(OH)2	-13.37	0.52	13.89	Fe(OH)2
Fe(OH)3	-2.46	3.17	5.64	Fe(OH)3
Fe2(SO4)3	-18.89	-15.85	3.05	Fe2(SO4)3
FeO	-13.00	0.52	13.52	FeO
Ferrite-Ca	-12.92	8.58	21.50	CaFe2O4
Ferrite-Cu	-5.13	5.15	10.28	CuFe2O4
Ferrite-Dicalcium	-46.00	10.80	56.80	Ca2Fe2O5
Ferrite-Mg	-13.21	7.81	21.02	MgFe2O4
Ferrite-Zn	-5.73	5.97	11.70	ZnFe2O4
FeSO4	-9.48	-6.88	2.61	FeSO4
Gibbsite	-4.34	3.40	7.74	Al(OH)3
Glauberite	-7.82	-13.29	-5.47	Na2Ca(SO4)2
Goethite	2.64	3.17	0.53	FeOOH
Gypsum	-0.64	-5.17	-4.53	CaSO4:2H2O
H2(g)	-31.34	-34.44	-3.10	H2
H2O(g)	-1.59	-0.00	1.59	H2O
H2S(g)	-91.06	-99.05	-7.99	H2S
Halite	-7.40	-5.84	1.56	NaCl
Hausmannite	-27.57	-17.43	10.14	Mn3O4
HCl(g)	-11.79	-5.48	6.30	HCl
Hematite	6.27	6.35	0.08	Fe2O3
Hercynite	-21.48	7.32	28.80	FeAl2O4
Hexahydrite	-4.21	-5.94	-1.73	MgSO4:6H2O
Hydrophilite	-20.49	-8.74	11.75	CaCl2
Ice	-0.14	-0.00	0.14	H2O
Jarosite	3.03	-6.38	-9.41	KFe3(SO4)2(OH)6
Jarosite-Na	-0.18	-5.63	-5.45	NaFe3(SO4)2(OH)6
K	-66.25	4.72	70.98	K
K(g)	-76.85	4.72	81.58	K
K2O	-86.24	-2.21	84.04	K2O
K3H(SO4)2	-14.49	-18.11	-3.62	K3H(SO4)2
Kainite	-12.21	-12.53	-0.31	KMgClSO4:3H2O
KAl(SO4)2	-15.78	-12.50	3.27	KAl(SO4)2
Katoite	-65.47	13.47	78.94	Ca3Al2H12O12
Kieserite	-5.67	-5.94	-0.27	MgSO4:H2O
KMgCl3	-37.34	-16.09	21.25	KMgCl3
KMgCl3:2H2O	-30.06	-16.10	13.96	KMgCl3:2H2O
Lammerite	-21.98	-20.42	1.55	Cu3(AsO4)2
Lawrencite	-19.50	-10.45	9.05	FeCl2
Leonite	-11.43	-15.54	-4.11	K2Mg(SO4)2:4H2O

Lime	-30.34	2.23	32.57	CaO
Magnetite	-3.55	6.87	10.42	Fe <sub>3</sub> O <sub>4</sub>
Manganite	-8.95	-9.11	-0.16	MnO(OH)
Manganosite	-17.12	0.79	17.92	MnO
Mayenite	-419.87	74.28	494.15	Ca <sub>12</sub> Al <sub>14</sub> O <sub>33</sub>
Melanterite	-4.48	-6.88	-2.40	FeSO <sub>4</sub> ·7H <sub>2</sub> O
Mercallite	-7.06	-8.50	-1.44	KHSO <sub>4</sub>
Mg	-109.40	13.12	122.52	Mg
Mg(g)	-129.13	13.12	142.25	Mg
Mg1.25SO <sub>4</sub> (OH)0.5:0.5H <sub>2</sub> O	-10.77	-5.57	5.20	Mg1.25SO <sub>4</sub> (OH)0.5:0.5H <sub>2</sub> O
Mg1.5SO <sub>4</sub> (OH)	-14.41	-5.20	9.21	Mg1.5SO <sub>4</sub> (OH)
MgCl <sub>2</sub> :2H <sub>2</sub> O	-22.24	-9.51	12.73	MgCl <sub>2</sub> :2H <sub>2</sub> O
MgCl <sub>2</sub> :4H <sub>2</sub> O	-16.81	-9.51	7.30	MgCl <sub>2</sub> :4H <sub>2</sub> O
MgCl <sub>2</sub> :H <sub>2</sub> O	-25.58	-9.51	16.07	MgCl <sub>2</sub> :H <sub>2</sub> O
MgOHCl	-19.91	-4.02	15.89	MgOHCl
MgSO <sub>4</sub>	-10.76	-5.94	4.83	MgSO <sub>4</sub>
Mirabilite	-6.96	-8.11	-1.15	Na <sub>2</sub> SO <sub>4</sub> :10H <sub>2</sub> O
Misenite	-49.55	-60.63	-11.08	K <sub>8</sub> H <sub>6</sub> (SO <sub>4</sub> ) <sub>7</sub>
Mn	-70.48	12.45	82.93	Mn
Mn(OH) <sub>2</sub> (am)	-14.52	0.79	15.31	Mn(OH) <sub>2</sub>
Mn(OH) <sub>3</sub>	-15.45	-9.11	6.34	Mn(OH) <sub>3</sub>
MnCl <sub>2</sub> :2H <sub>2</sub> O	-14.17	-10.18	4.00	MnCl <sub>2</sub> :2H <sub>2</sub> O
MnCl <sub>2</sub> :4H <sub>2</sub> O	-12.93	-10.18	2.75	MnCl <sub>2</sub> :4H <sub>2</sub> O
MnCl <sub>2</sub> :H <sub>2</sub> O	-15.72	-10.18	5.54	MnCl <sub>2</sub> :H <sub>2</sub> O
MnO <sub>2</sub> (gamma)	-10.96	-27.09	-16.13	MnO <sub>2</sub>
MnSO <sub>4</sub>	-9.21	-6.61	2.61	MnSO <sub>4</sub>
Molysite	-26.75	-13.28	13.47	FeCl <sub>3</sub>
Na	-61.90	5.47	67.37	Na
Na(g)	-75.39	5.47	80.86	Na
Na <sub>2</sub> O	-68.13	-0.71	67.42	Na <sub>2</sub> O
Na <sub>3</sub> H(SO <sub>4</sub> ) <sub>2</sub>	-14.98	-15.87	-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	-15.50	-21.40	-5.89	Na <sub>4</sub> Ca(SO <sub>4</sub> ) <sub>3</sub> :2H <sub>2</sub> O
NaFeO <sub>2</sub>	-17.07	2.82	19.88	NaFeO <sub>2</sub>
Nantokite	-12.85	-19.61	-6.77	CuCl
O <sub>2</sub> (g)	-20.42	-23.31	-2.89	O <sub>2</sub>
Orpiment	-272.25	-351.73	-79.49	As <sub>2</sub> S <sub>3</sub>
Oxychloride-Mg	-28.39	-2.56	25.83	Mg <sub>2</sub> Cl(OH) <sub>3</sub> :4H <sub>2</sub> O
Pentahydrite	-4.55	-5.94	-1.39	MgSO <sub>4</sub> :5H <sub>2</sub> O
Periclase	-19.86	1.46	21.33	MgO
Picromerite	-11.11	-15.55	-4.44	K <sub>2</sub> Mg(SO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O
Polyhalite	-11.58	-25.89	-14.31	K <sub>2</sub> MgCa <sub>2</sub> (SO <sub>4</sub> ) <sub>4</sub> :2H <sub>2</sub> O
Portlandite	-20.32	2.22	22.55	Ca(OH) <sub>2</sub>
Pyrite	-149.97	-174.67	-24.70	FeS <sub>2</sub>
Pyrolusite	-9.43	-27.09	-17.66	MnO <sub>2</sub>
Pyrrhotite	-94.79	-98.53	-3.74	FeS
Realgar	-105.82	-166.10	-60.28	AsS
S	-65.60	-110.71	-45.11	S
S <sub>2</sub> (g)	-145.09	-152.28	-7.19	S <sub>2</sub>
Scacchite	-18.92	-10.18	8.74	MnCl <sub>2</sub>
SO <sub>2</sub> (g)	-33.42	-33.25	0.18	SO <sub>2</sub>
Sphalerite	-87.96	-99.43	-11.47	ZnS
Spinel	-29.35	8.26	37.61	Al <sub>2</sub> MgO <sub>4</sub>
Starkeyite	-4.94	-5.94	-1.00	MgSO <sub>4</sub> :4H <sub>2</sub> O
Sylvite	-7.42	-6.59	0.83	KCl
Syngenite	-7.18	-14.78	-7.60	K <sub>2</sub> Ca(SO <sub>4</sub> ) <sub>2</sub> :H <sub>2</sub> O
Tachyhydrite	-44.90	-27.76	17.14	Mg <sub>2</sub> CaCl <sub>6</sub> :12H <sub>2</sub> O
Tenorite	-8.85	-1.20	7.65	CuO
Thenardite	-7.75	-8.11	-0.36	Na <sub>2</sub> SO <sub>4</sub>
Todorokite	-63.82	-109.64	-45.82	Mn <sub>7</sub> O <sub>12</sub> :3H <sub>2</sub> O
Troilite	-94.69	-98.53	-3.84	FeS
Wurtzite	-90.26	-99.43	-9.17	ZnS
Wustite	-11.63	0.78	12.40	Fe <sub>94</sub> 7O
Zincite	-11.58	-0.38	11.20	ZnO
Zn	-57.51	11.28	68.79	Zn
Zn(ClO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O	-141.69	-136.06	5.63	Zn(ClO <sub>4</sub> ) <sub>2</sub> :6H <sub>2</sub> O
Zn(g)	-74.13	11.28	85.41	Zn
Zn(OH) <sub>2</sub> (beta)	-12.31	-0.38	11.93	Zn(OH) <sub>2</sub>

Zn(OH)2(epsilon)	-12.04	-0.38	11.66	Zn(OH)2
Zn(OH)2(gamma)	-12.26	-0.38	11.88	Zn(OH)2
Zn2(OH)3Cl	-21.54	-6.24	15.29	Zn2(OH)3Cl
Zn2SO4(OH)2	-15.74	-8.16	7.58	Zn2SO4(OH)2
Zn3(AsO4)2	-27.28	-17.96	9.31	Zn3(AsO4)2
Zn3O(SO4)2	-35.03	-15.94	19.09	Zn3O(SO4)2
ZnCl2	-18.43	-11.35	7.08	ZnCl2
ZnSO4	-11.31	-7.78	3.53	ZnSO4
ZnSO4:6H2O	-6.08	-7.78	-1.70	ZnSO4:6H2O
ZnSO4:7H2O	-5.90	-7.78	-1.88	ZnSO4:7H2O
ZnSO4:H2O	-7.23	-7.78	-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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