

Name

Mine tailings FI for Lite

pH Dependent Leaching Test Scenario



Lab Test



Extra L/S Simulation

Lab Test

Model Parameters

Entity	Unit	Default
c0		-7.458
c1		2.382
c2		-1.099
c3		0.1880
c4		-0.01356
c5		0.0003514
Clay	mg/kg	1.500E+04
Hydrous Ferric Oxide	mg/kg	2300
L/S	L/kg	10.01
pE		5.300
pH		7.230
Solid Humic Acid	mg/kg	450.0
Simulated Low L/S	L/kg	0.4000

Available Content

Entity	Unit	Default	Entity	Unit	Default
Acetic acid	mg/kg	2.220E-07	F	mg/kg	98.39
Ag	mg/kg	1.079E-07	Fe	mg/kg	5897
Al	mg/kg	1091	B	mg/kg	2.697
As	mg/kg	20.51	Si	mg/kg	1449
Ba	mg/kg	0.6093	Hg	mg/kg	2.006E-07
Br	mg/kg	7.990E-08	K	mg/kg	172.0
Ca	mg/kg	2.647E+04	Li	mg/kg	1.368
Cd	mg/kg	1.407	Mg	mg/kg	6067
Cl	mg/kg	92.00	Mn	mg/kg	387.0
Co	mg/kg	0.8699	Mo	mg/kg	0.1001
CO32-	mg/kg	3.750E+04	Na	mg/kg	16.55
Cr	mg/kg	4.352	Ni	mg/kg	4.807
Cu	mg/kg	119.1	NO3	mg/kg	6.200E-08

Solid Solutions

Name	End Member	Log(K)	Reaction
None			

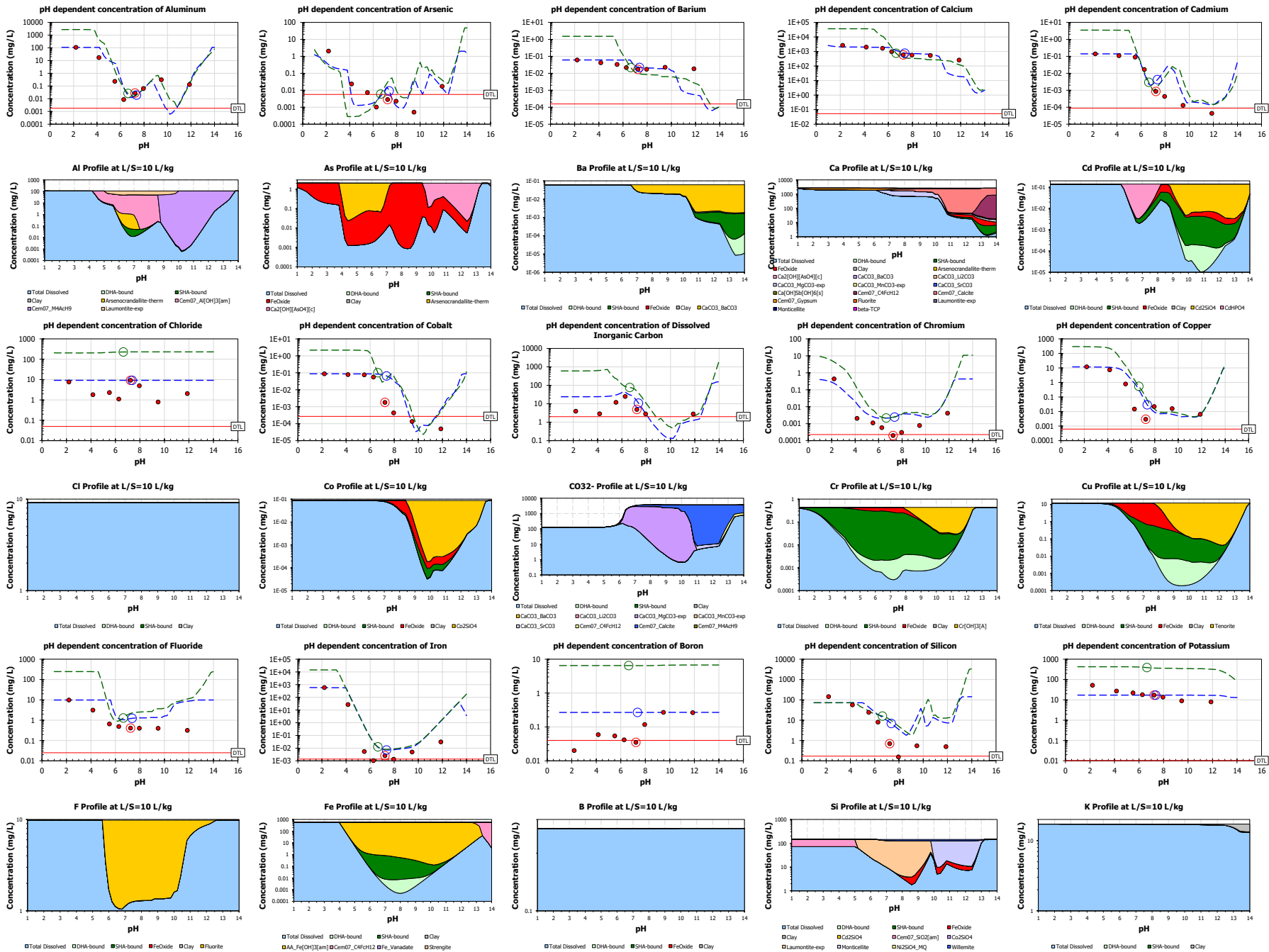
Minerals

Name	> 1E-13 mol/kg	Log(K)	Reaction
AA_Fe[OH]3[am]	Yes	16.60	AA_Fe[OH]3[am] + 1 H2O -> 1 Fe[OH]4- + 1 H+
Arsenocrandallite-therr	Yes	95.56	Arsenocrandallite-therr + 6 H2O -> 3 Al[OH]4- + 2 AsO4-3 + 1 Ca+2 + 7 H+
BaSrSO4[50%Ba]	Yes	8.221	BaSrSO4[50%Ba] -> 0.5 Ba+2 + 1 SO4-2 + 0.5 Sr+2
beta-TCP	Yes	28.93	beta-TCP -> 3 Ca+2 + 2 PO4-3
Ca[OH]Sb[OH]6[s]	Yes	2.000	Ca[OH]Sb[OH]6[s] + 1 H+ -> 1 Ca+2 + 1 H2O + 1 Sb[OH]6-
Ca2[OH][AsO4][c]	Yes	4.000	Ca2[OH][AsO4][c] + 1 H+ -> 1 AsO4-3 + 2 Ca+2 + 1 H2O
CaCO3_BaCO3	Yes	22.00	CaCO3_BaCO3 -> 1 Ba+2 + 2 CO3-2 + 1 Ca+2
CaCO3_Li2CO3	Yes	21.30	CaCO3_Li2CO3 -> 2 CO3-2 + 1 Ca+2 + 2 Li+
CaCO3_MgCO3-exp	Yes	18.02	CaCO3_MgCO3-exp -> 2 CO3-2 + 1 Ca+2 + 1 Mg+2
CaCO3_MnCO3-exp	Yes	20.78	CaCO3_MnCO3-exp -> 2 CO3-2 + 1 Ca+2 + 1 Mn+2
CaCO3_SrCO3	Yes	19.85	CaCO3_SrCO3 -> 2 CO3-2 + 1 Ca+2 + 1 Sr+2
CaSb[OH]6[s]2_exp	Yes	19.41	CaSb[OH]6[s]2_exp -> 1 Ca+2 + 2 Sb[OH]6-
Cd2SiO4	Yes	6.059	Cd2SiO4 + 2 H+ -> 2 Cd+2 + 1 H2SiO4-2
CdHPO4	Yes	26.48	CdHPO4 -> 1 Cd+2 + 1 H+ + 1 PO4-3
Cem07_Al[OH]3[am]	Yes	13.76	Cem07_Al[OH]3[am] + 1 H2O -> 1 Al[OH]4- + 1 H+
Cem07_Brucite	Yes	-16.83	Cem07_Brucite + 2 H+ -> 2 H2O + 1 Mg+2
Cem07_C4Fch12	Yes	-20.47	Cem07_C4Fch12 + 4 H+ -> 1 CO3-2 + 4 Ca+2 + 2 Fe[OH]4- + 10 H2O
Cem07_C4Fsh12	Yes	-22.77	Cem07_C4Fsh12 + 4 H+ -> 4 Ca+2 + 2 Fe[OH]4- + 10 H2O + 1 SO4-2
Cem07_Calcite	Yes	8.485	Cem07_Calcite -> 1 CO3-2 + 1 Ca+2
Cem07_Gypsum	Yes	4.583	Cem07_Gypsum -> 1 Ca+2 + 2 H2O + 1 SO4-2
Cem07_M4Ach9	Yes	-4.823	Cem07_M4Ach9 + 4 H+ -> 2 Al[OH]4- + 1 CO3-2 + 7 H2O + 4 Mg+2

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Name	> 1E-13 mol/kg	Log(K)	Reaction
Cem07_SiO2[am]	Yes	24.21	Cem07_SiO2[am] + 2 H2O -> 2 H+ + 1 H2SiO4-2
Co2SiO4	Yes	6.289	Co2SiO4 + 2 H+ -> 2 Co+2 + 1 H2SiO4-2
CoHPO4[s]	Yes	24.48	CoHPO4[s] -> 1 Co+2 + 1 H+ + 1 PO4-3
Cr[OH]3[A]	Yes	68.13	Cr[OH]3[A] + 1 H2O -> 1 CrO4-2 + 5 H+ + 3 e-
Fe_Vanadate	Yes	19.18	Fe_Vanadate + 1 H2O -> 0.5 Fe[OH]4- + 1 VO2+ + 0.5 e-
Fluorite	Yes	10.96	Fluorite -> 1 Ca+2 + 2 F-
Laumontite-exp	Yes	116.0	Laumontite-exp + 8 H2O -> 2 Al[OH]4- + 1 Ca+2 + 8 H+ + 4 H2SiO4-2
Manganite	Yes	-25.27	Manganite + 3 H+ + 1 e- -> 2 H2O + 1 Mn+2
Monticellite	Yes	-8.653	Monticellite + 2 H+ -> 1 Ca+2 + 1 H2SiO4-2 + 1 Mg+2
Ni[OH]2[s]	Yes	-10.80	Ni[OH]2[s] + 2 H+ -> 2 H2O + 1 Ni+2
Ni2SiO4_MQ	Yes	7.079	Ni2SiO4_MQ + 2 H+ -> 1 H2SiO4-2 + 2 Ni+2
NiHPO4	Yes	25.00	NiHPO4 -> 1 H+ + 1 Ni+2 + 1 PO4-3
Pb[OH]2[C]	Yes	-8.150	Pb[OH]2[C] + 2 H+ -> 2 H2O + 1 Pb+2
PbHPO4	Yes	28.00	PbHPO4 -> 1 H+ + 1 PO4-3 + 1 Pb+2
PbMoO4[c]	Yes	15.80	PbMoO4[c] -> 1 MoO4-2 + 1 Pb+2
PbOH[Sb[OH]6]_exp1	Yes	12.00	PbOH[Sb[OH]6]_exp1 + 1 H+ -> 1 H2O + 1 Pb+2 + 1 Sb[OH]6-
Sn[OH]2[s]	Yes	1.447	Sn[OH]2[s] + 2 H+ -> 2 H2O + 1 Sn+2
Strengite	Yes	48.00	Strengite + 2 H2O -> 1 Fe[OH]4- + 4 H+ + 1 PO4-3
Tenorite	Yes	-7.620	Tenorite + 2 H+ -> 1 Cu+2 + 1 H2O
Willemite	Yes	6.289	Willemite + 2 H+ -> 1 H2SiO4-2 + 2 Zn+2



Model Comparison: residuals - Concentration

Sample

Name Copper mine tailings FI

Residual details, concentrations

Fraction	Residuals as log(model/sample)				Own pH				Total Avg
	8	7	6	5	4	3	2	1	
<i>pH</i>	2.20	4.16	5.51	6.27	7.23	7.95	9.48	11.9	<i>Deviation</i>
Al	0.00	0.80	1.43	0.96	-0.25	-0.03	-1.55	0.14	0.31
As	-0.80	-0.78	-0.71	0.36	0.69	-0.27	1.86	-0.09	0.30
Ba	0.00	0.16	0.26	0.45	0.14	0.08	-0.09	-1.52	0.20
Br	-	-	-	-	-	-	-	-	-
Ca	-0.11	0.00	0.07	0.24	0.13	0.11	0.09	-1.12	0.15
Cd	0.00	0.11	0.19	-0.23	0.59	1.53	0.60	0.50	0.23
Cl	0.08	0.71	0.60	0.92	0.00	0.26	1.07	0.65	0.23
Co	0.00	0.04	0.05	0.18	1.59	1.90	-0.08	1.15	0.34
CO32-	-	-	-	-	-	-	-	-	-
Cr	-0.26	0.85	0.37	0.57	1.06	1.09	0.58	1.06	0.28
Cu	-0.01	0.17	0.75	1.78	1.16	-0.37	-0.39	-0.03	0.29
F	0.00	0.49	1.18	0.39	0.47	0.51	0.54	1.43	0.27
Fe	-0.01	0.99	2.02	1.46	0.45	0.75	0.39	1.64	0.41
B	1.13	0.66	0.70	0.81	0.88	0.36	0.00	0.01	0.24
Si	-0.30	0.10	0.26	0.38	1.05	1.37	1.39	1.18	0.32
Hg	-	-	-	-	-	-	-	-	-
K	-0.48	-0.20	-0.11	-0.02	0.00	0.10	0.28	0.32	0.09
Li	0.00	0.51	0.61	0.70	0.89	0.92	1.06	1.39	0.30
Mg	0.00	0.31	0.58	0.80	0.03	0.20	0.82	0.07	0.17
Mn	0.00	0.17	0.29	-0.71	-0.58	0.03	1.73	-0.33	0.25
Mo	1.56	-0.39	1.45	0.99	0.22	0.12	0.08	0.00	0.30
Na	-0.36	-0.16	-0.10	-0.02	0.00	-1.65	-2.10	-2.57	0.47
Ni	0.00	0.02	0.06	-0.11	1.25	1.95	-0.47	0.79	0.31
NO3	-	-	-	-	-	-	-	-	-
Pb	0.00	0.73	1.05	0.58	0.36	1.06	0.27	0.32	0.23
PO4	-	-	-	-	-	-	-	-	-
Sb	0.00	-0.17	0.83	1.01	1.66	0.07	0.39	0.72	0.28
Se	0.00	0.15	-0.29	0.04	0.13	-0.37	0.60	0.49	0.12
Sn	-0.15	-0.55	-0.76	-0.32	-0.07	0.03	0.11	1.26	0.20
SO4	-	-	-	-	-	-	-	-	-
Sr	0.00	0.14	0.25	0.53	0.68	0.64	0.59	-0.94	0.20
Th	-	-	-	-	-	-	-	-	-
U	-	-	-	-	-	-	-	-	-
V	-0.04	1.16	1.81	1.44	0.19	-1.34	0.20	0.37	0.37
Zn	0.00	0.11	0.19	0.68	1.23	0.54	0.06	0.53	0.20
Avg Deviation	0.08	0.10	0.16	0.15	0.15	0.17	0.17	0.19	0.26