**#PHREEQC input**

Solution 1

pH 4.9

Temp 10

units mol/kgw

Cl 2.65e-4

P 1.0e-7

Na 2.65e-3

N(5) 1 charge

SELECTED\_OUTPUT

-file C:

-reset false

-activities H+ Pb+2

-pH

-saturation\_indices galena anglesite cerrusite clpyromorphite

-equilibrium\_phases galena cerrusite anglesite clpyromorphite

Save Solution 1

End

Use Solution 1

Equilibrium\_phases 1

CO2(g) -3.4 10

O2(g) -0.68 10

Save Solution 2

End

Use Solution 2

Equilibrium\_phases 2

Kaolinite 0 10

Kmica 0 10

Quartz 0 10

#Siderite 0 10

Annite 0 10

#Anorthite 0 10

Goethite 0 10

#Calcite 0 0

CO2(g) -3.4 10

O2(g) -0.68 10

Save Solution 3

End

#Use Solution 3

#Equilibrium\_phases 3

#Pyrite 0 0.00001

#Save Solution 4

#End

Use solution 3

Incremental\_reactions true.

REACTION 1

PbS 1

2.4e-4 in 250 steps

Equilibrium\_phases 3

Clpyromorphite 0 0

Anglesite 0 0

Cerrusite 0 0

#Goethite 0 0

CO2(g) -3.4 10

O2(g) -0.68 10

Save Solution 3

End

**#PHREEPLOT input**

SPECIATION

jobTitle "Lead speciation"

Database wateq4f.dat

calculationType ht1

calculationMethod 1

mainSpecies "minerals"

xmin 2

xmax 10

ymin 0

ymax 10

resolution 200

PLOT

plotTitle "aPb vs pH"

xtitle pH

ytitle " <i>Pb/H+</i>"

labelColor black # colour of the field labels

info black # colour of the info and filename

extraText "extratextPb.dat"

CHEMISTRY

PHASES

Fix\_Pb/H # Pb/H+

Pb(OH)2 = Pb+2 + 2H2O - 2H+

log\_k 0.0

Fix\_H+

H+=H+

Log\_k 0.0

include 'minstab1.inc'

SOLUTION 1

temp 25

pH 7

units mol/kgw

Pb 1e-12

S 1.35e-4

Cl 2.60e-4

Na 2e-2

P 1.29e-5

N(5) 1 charge

End

Use Solution 1

Equilibrium\_Phases 1

O2(g) -0.69 10

CO2(g) -2.5 10

Save Solution 2

End

USE Solution 2

EQUILIBRIUM\_PHASES 2

Fix\_H+ -<x\_axis> NaOH 10

Fix\_Pb/H <y\_axis> Pb(OH)2 10

-force\_equality true

Galena 0 0

Cerrusite 0 0

Anglesite 0 0

#Hydrocerrusite 0 0

Clpyromorphite 0 0

O2(g) -0.69 10

CO2(g) -2.5 10

END