The impact of soil salinization on ground water chemistry (Zhang Luqianxue)

Introduction

Modeling

Code for rainwater evaporation

```
TITLE Rainwater evaporation from Ladouche2009
SOLUTION 1  Precipitation of rainfall in the South France
        units           ueq/L
        pH               6.2
        Ca              163.3
        Mg              103.6
        Na              419.5
        K               13.9
        Cl              572.8
        C(4)            188.2   as HCO3   CO2(g)    -2.2
        S(6)            98.5
        N(-3)           35.5
        N(5)            42.8
     Br              0.195
      B              1.4616
      Sr              0.0286
      Se              1.963

EQUILIBRIUM_PHASES 1 Equilibrate with Minerals and gas
    CO2(g)        -0.7   #change from -0.7 to -3.4
    Calcite        0
SAVE solution 2
SELECTED_OUTPUT
    -file    EvpRWLadouche2009.txt
    -pH
    -molalities    Ca+2 Mg+2 Na+ K+ Cl- SO4-2 NH4+ NO3- Br- H3BO3 Sr+2
HSeO3- SeO3-2 HCO3- CO3-2
    -saturation_indices    Calcite Gypsum  Epsomite

END

TITLE Evaprate water
USE solution 2
REACTION 1 evaporation
    H2O    -1.0
    5.55 11.11 16.67 22.22 27.78 33.33 38.89 44.44 50.0 51.0 52.0 53.0 54.0
55.0 55.1 55.2 55.3 55.4 55.41 55.42 55.43 55.44 55.45 55.46 55.47 55.48
```

```
55.49 55.5 moles
SAVE solution 3
```

code for irrigation water evaporation

```
TITLE Irrigation water evaporation from Galazoulas2014
SOLUTION 1  Precipitation of rainfall in the Greece
        units           mg/L
    temp              22.4
       pH               7.1
        Ca              513.2
        Mg              140.5
        Na              279.1
        K               4.1
        Cl              1619
        C(4)            198 as HCO3
        S(6)            129.5
    N(5)                1.2
     Sr            2.3571
    As               0.0055
    Co        0.0005 charge
    Cr        0.0245
    Li        0.0219
    Mn        0.0023
    Zn        0.1871
    Se        0.0168
    Ni        0.003
    Fe        1.6406


EQUILIBRIUM_PHASES 1 Equilibrate with Minerals and gas
    CO2(g)                -0.7
    Calcite        0
SAVE solution 2
SELECTED_OUTPUT
    -file    Openme.txt
    -pH
    -molalities    Ca+2 Mg+2 Na+ K+ Cl- SO4-2 NH4+ NO3- Br- H3BO3 Sr+2
HSeO3- SeO3-2 HCO3- CO3-2 HAsO4-2 H2AsO4- Co+2 Cr(OH)2+ Cr(OH)+2 Cr(OH)3
Fe+2 FeSO4 Fe(OH)2+ Fe(OH)3 Fe(OH)4- Li+ Mn+2 Ni+2 HSeO3- Sr+2 Zn+2
    -saturation_indices    Calcite Gypsum  Epsomite

END

TITLE Evaprate water
USE solution 2
REACTION 1 evaporation
    H2O    -1.0
    5.55 11.11 16.67 22.22 27.78 33.33 38.89 44.44 50 51 52 53 54 55 55.1
55.2 55.3 55.31 55.32 55.33 55.34 55.35 55.36 55.37 55.38 55.39 55.4 moles
```

```
SAVE solution 3
```

Result

Rainwater

comparisontraceladouche2009.xlsx

Irrigation water

comparisontracegalazoulas2014.xlsx

raw data:

tracegalazoulas2014.xlsx

Source:

galazoulas2014.pdf

Structure