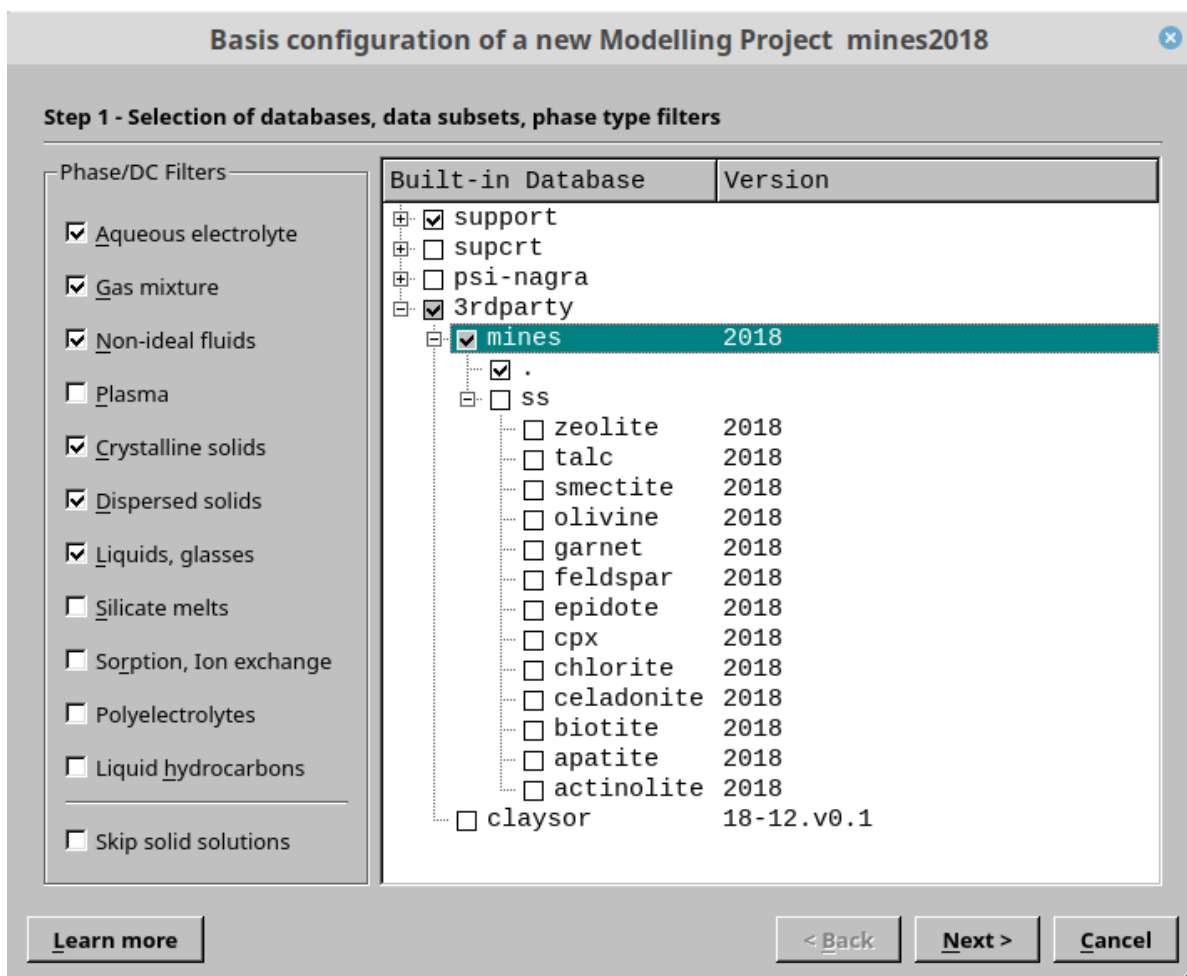


1. Unzip the DB18.default archive.
2. Merge it to the DB.default folder of your gems3.app installed subfolder by copying-pasting the files into DB.default.
3. Start GEM-Selektor v.3.5 and make a new project.
4. Select the Mines database as in the attached screenshot.
5. Select all elements.
6. Setup of aqueous species, select option 2 (Helgeson) and click Check.
7. Switch to the tab “Select Gas/Fluid Mixture Model”, select the PRSV model and click Check

A more in depth tutorial to prepare you first project with the mines2018 database can be found here <http://tdb.mines.edu/tutorials/Module1.pdf>



Here you should select “support” and 3rdparty/mines/. (contains all mineral endmembers, gases and aqueous species) and if you are an advanced user select also 3rdparty/mines/ss. Note that these solid solutions are currently generated assuming ideal ss except feldspar which is based on a ternary non-ideal solid solution model.

Setup of aqueous and gas phases in project: MyWork1

Select Aqueous Electrolyte Model | Select Gas/Fluid Mixture Model

Ion-association (IA) with Davies equation, D (default)
 IA with extended Debye-Hueckel equation (Helgeson), common b_{gamma} and a_0 , H
 IA with extended Debye-Hueckel equation (Shvarov), common b_{gamma} and a_0 , Y
 IA with extended Debye-Hueckel equation (Karpov), common b_{gamma} , individual a_0 , 3
 IA with Debye-Hueckel equation, no b_{gamma} , individual a_0 , 2
 IA with Debye-Hueckel limiting law (very low ionic strength), 1

 Do not generate; select a user-defined Phase record from database (Q, S, Z), U
 Do not include aqueous electrolyte phase into the system definition, N

Parameters for the aqueous phase model

$b_{\text{gamma}}(1,298)$ value: 0.064

$b_{\text{gamma}}(P,T)$ mode: NaCl

Common a_0 value: 3.72

Gamma (neutral species): Calculate as b_{gamma}

Gamma (water solvent): From osmotic coefficient

Molality conversion: Applied to all species

Phase record key: a AQELIA aq_gen aq EDH_H

OK Cancel Check Learn more

Select the activity model for aqueous species.

Setup of aqueous and gas phases in project: MyWork1

Select Aqueous Electrolyte Model | Select Gas/Fluid Mixture Model

Ideal mixture of gaseous components, I (default)
 Churakov-Gottschalk (CG) multicomponent fluid EoS model, F
 Peng-Robinson (PR) multicomponent fluid EoS model, Z
 Peng-Robinson-Stryjek-Vera (PRSV) multicomponent fluid EoS model, P
 Soave-Redlich-Kwong (SRK) multicomponent fluid EoS model, E

 Do not generate; select a user-defined Phase record from database, U
 Do not include gas/fluid mixture phase into the system definition, N

Phase record key: f PRSV fluid_gen gm PRSV_EoS

OK Cancel Check Learn more

Select the EOS for gases, i.e. choose PRSV and make sure to click Check.