MINEQL+ Version 4.6 User Guide

System Requirements
- PC (running Windows XP, Windows 7 or Windows 8 in any of its versions – Home, Pro, etc.)
- At least 4 MB of RAM
- At least 2.5 MB of hard disk space

Installation
- Start Windows
- Double click on MINEQL.exe file
- Follow instructions on the screen

Launch MINEQL+ Program
- Click on Start | Program | MINEQL+ | MINEQL+
- MINEQL+ program should open on your screen
Tutorial
Please note that this is only intended to be a basic instructional guide to set up simple ionic equilibrium problems. Please consult the HELP wizard for more details. This guide will consider MgSO₄ at pH 8.2 at 25°C as an example. Launch MINEQL+ by going to Start | Programs | MINEQL+ | MINEQL+

Chemical Components Selection Module should launch automatically. Select the components in the system by clicking Mg²⁺ and SO₄²⁻ and they should be highlighted in blue. (Note, H₂O and H⁺ are highlighted by default)

After selecting all the components, click Scan THERMO.
After clicking Scan THERMO, the Aqueous Species Module should appear on screen and it shows the aqueous species selected and their thermodynamic data (built within MINEQL+), which can be altered if desired.

For this example, no change is made. Click Close.
After clicking **Close**, the **Tableau Switch Module** appears on screen. This allows the user to jump and view different species types. View and make necessary modifications if desired. Again for this example, no modification will be made. Click **NO** to launch **Run Time Manager**.

**Run Time Manager** allows the user to specify a fixed temperature (default = 25°C) and ionic strength (≤ 0.50) or let **MINEQL+** calculate ionic strength using the concentrations of the species entered by the user and thermodynamic data (K values) which are built in the program.

For our MgSO₄ example, fix the ionic strength at 0.500 molar and temperature at 25°C. Enter an Output Data Name, then click the **Wizard** button.
After clicking **Wizard**, the **Calculation Wizard** should appear. This module allows the user to enter the total dissolved concentration of each component chosen. For our MgSO₄ example, enter 0.0545 M for Mg²⁺ and 0.0289 M for SO₄²⁻.

![Calculation Wizard](image)

Click on the **pH** tab to supply a fixed pH value or allow the **MINEQL+** program to calculate pH base on the components entered by the user. For our example, fix the pH at 8.20.
Click on the CO₂, Solids Mover and Redox tabs if necessary. For our example, we will not concern ourselves with them at this time.

Click OK to go back to Run Time Manager. Click RUN.
Output Manager should appear. Choose the Output Type and click Component that you wish to view. For example, select Component Groups and Mg(2+) and choose View.
A table of all Mg$^{2+}$ species should appear containing concentration of each species and their respective percentages.
In addition to the table output format, the results can also be displayed as Bar Graphs by clicking the GRAPH IT, then the PLOT button.
A more comprehensive display can be found in table format by clicking **Special Reports** under **Output Type** and select **Summary of All Species for a Single Run**.

You now have taught yourself how to set up an ionic equilibrium problem in **MINEQL+**. Please explore all the convenient functions that **MINEQL+** has to offer and enjoy. To get more information about **MINEQL+**, please go to their website [WWW.MINEQL.COM](http://WWW.MINEQL.COM)

**Reference**