

Chemistry Kickstart Workshop: Applying Ideas + Equilibrium

This Chemistry Kickstart workshop topic includes the syllabus components below.

Module 5: Equilibrium and Acid Reactions

- **The Reaction of copper and concentrated nitric acid / Le Chatelier's Principle $\text{NO}_2/\text{N}_2\text{O}_4$** (Covers Factors that Affect Equilibrium and Calculating the Equilibrium Constant)

This experiment is used to not only show the reaction of a concentrated acid with a metal but also to illustrate equilibrium using the resultant gases and varying temperature changes. Le Chatelier's Principle is demonstrated by invoking a colour change inside a sealed tube containing $\text{NO}_2/\text{N}_2\text{O}_4$ (from the previous reaction).

Module 8: Applying Chemical Ideas

- **Sulfate Content Determination in Fertiliser** (Covers Analysis of Inorganic Substances)

This experiment is a hands-on practical where the students are able to experience first-hand the use of a gravimetric technique for the analysis of sulphate in lawn food and to experience the limitations of an analysis of this type. They will be using vacuum equipment and sintered glass filters that are not readily available.

- **Determination of Hardness in Natural Waters** (Covers Analysis of Inorganic Substances)

This is a hands-on practical experiment and helps the students to master the very important chemical analysis technique of titration. It also utilises a complexation reaction between Mg^{2+} and EDTA to test for the presence of Mg^{2+} in water.

- **Determining the Iron Content in Natural Waters** (Covers Analysis of Inorganic Substances)

This experiment is hands-on and shows another type of analysis of metals present in water using a scanning absorption spectrometer. This experiment also demonstrates the use of chemicals to first create a coloured chemical complex to enable this technique to be used.

- **Atomic Absorption Spectroscopy** (Covers Analysis of Inorganic Substances)
To demonstrate the analysis of the iron content in water. This instrument may be used for the highly sensitive analysis of very low concentrations of metals in water. We also do a spectacular flame test for many of the salts.

****Optional**:** if you'd like to swap one of the above component modules with the following option instead, please select "Combination of Modules" when registering.

- **Module 8: Determining the Chlorine Content in Natural Waters** (Covers Analysis of Inorganic Substances)

This hands-on practical uses a titration but this time of a very different sort to analyse chlorine in water using chemicals not readily available to high schools. This experiment investigates the precipitation reaction that occurs when silver and chloride ions are mixed.