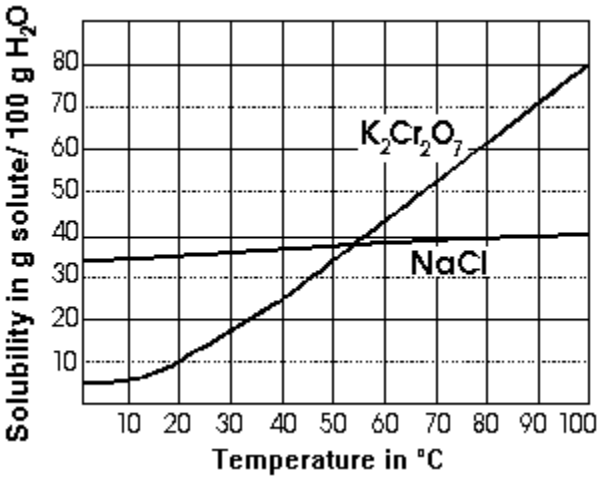
Fractional Crystallization

Introduction:

The technique of fractional crystallization is used by chemist to separate a mixture of dissolved substances (salts) in a solvent into its purified components (salts). This is accomplished by taking advantage of the variation of solubility of different salts in a given solvent with temperature. The solution containing the mixture is evaporated until the least soluble substance (salt) crystallizes out.

In this experiment you will be given a sample containing potassium dichromate $K_2Cr_2O_7$ and sodium chloride NaCl, both of which are water soluble ionic substances, with different solubilities at different temperatures. Sodium Chloride exhibits little change in solubilty between the range of 0 °C to 100 °C, while potassium dichromate solubility increases 16-fold over the same temperature range. This property can be used to separate a mixture of the two salts from a solution.



Experimental Procedure:

Step One: Prepare a solution of the two salts - First obtain a 100 ml beaker then add 60 ml of distilled water at room temperature. Next add a 12 gram sample of Sodium Chloride NaCl and a 15 gram sample of Potassium dichromate, mix and then heat the solution with a bunsen burner (to about 45 °C) until all the solid has dissolved.

Step Two: Cool solution - Obtain a 600 ml beaker from the equipment menu, then fill with 300 ml of ice water. Ice water may be obtained using the distilled water dialog box from the chemical menu. Place the 100ml beaker into the 600ml beaker by selecting the combine menu option, from the arrange menu. Cool until all the potassium dichromate has come out of solution (0 °C).

Step Three: Remove solid potassium dichromate from solution - First obtain a filtering flask with Buchner funnel, this is done by picking a 100 ml erlymeyer flask and then adding a buchner funnel to it by selecting the Buchner funnel menu item form the equipment menu, while the flask is picked. Then pour the solution from the beaker into the filtering flask with buchner funnel, until beaker is empty

Step Four: Removing sample from the filter - To remove sample from filter pick the flask and again select the buchner funnel option from the equipment menu. This time a dialog box will appear indicating the presence of solid in the filter. Select the piece of lab equipment you wish the sample to be transferred to

and press OK.

Step Five : Removing sodium chloride from solution - to finally remove sodium chloride from solution heat the solution and boil away the remaining water. Check the final product to ensure that you can account for all of the salts.