DETERMINING A SOLUBILITY CURVE

AIM:

To obtain the solubility curve for potassium chlorate, $KClO_3$

BACKGROUND:

A solubility curve is determined for a substance so that chemists know how much solute they can add to a solvent in order to obtain a saturated solution.

APPARATUS:

4 g pure crystalline potassium chlorate

burette

large clean test tube and glass stirring rod

thermometer

150 mL distilled water

600 mL beaker

Bunsen burner

tripod and gauze mat

METHOD:

1. Accurately weigh 4 g of $KClO_3$ into a large test tube. Record the mass.

2. Add 10.0 mL of distilled water from a burette.

3. Immerse the test tube in a beaker of boiling water so that the water level outside the tube is at least 3 cm higher than the level inside.

4. Carefully stir the mixture with the stirring rod until all the solid has dissolved.

5. Allow the tube to cool by removing it from the water and holding it up to the light. Stir constantly with the stirring rod.

6. Record the temperature at which crystals first appear.

7. Use the burette to add 2.5 mL of distilled water to the test tube and repeat the above.

8. Repeat step 7 until at least five results have been recorded.

RESULTS:

1. For each temperature recorded, calculate the solubility of $KClO_3$. (Note: 100 mL of water has an approximate mass of 100 g, although this may change with temperature.)

2. Tabulate your results in a table with the column headings shown below.

Mass (g)	Volume H_2O(mL)	Solubility(g/100 g)	Temperature (°C)

3. Plot a graph of temperature against solubility, placing temperature on the x-axis and solubility on the y-axis. Draw a smooth line of best fit to obtain the solubility curve.

QUESTIONS

1. Why is the stirring so important?

2. Suggest where any errors may have occurred in your experiment.

3. From your curve determine the solubility of $KClO_3$ is at 55°C.