DETERMINING A SOLUBILITY CURVE

AIM:

To obtain the solubility curve for potassium chlorate, KClO3

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:

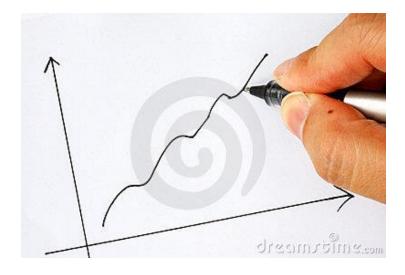
- 1. Accurately weigh 4 g of KClO $_3$ into a large test tube. Record the mass.
- 2. Add 10.0 mL of distilled water from a burette.
- 3. Immerse the test tube in a beaker of boiling water so that the water level outside the tube is at least 3 cm higher than the level inside.
- 4. Carefully stir the mixture 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 $KCIO_3$. (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 ₂ O(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 KClO₃ is at 55°C.

