Making a Soluble Salt Activity Student Sheet

Aim of this activity
To prepare a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.
Summary of what you will be doing
You will react dilute hydrochloric acid and an insoluble salt (copper oxide) to prepare an **aqueous solution** of a salt. The unreacted solid copper oxide from the reaction will need to be filtered. You will evaporate the **filtrate** to leave a **concentrated solution** of the salt, which will crystallise as it cools and **evaporates** further.

Before you begin

1. Explain what is meant by each of the words in **bold** above.
   Aqueous solution:

   Filtrate:

   Concentrated solution:

   Evaporates:

2. Summarise briefly the **precautions** you will take to ensure your safety throughout this practical activity.

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3. Draw a labelled diagram to show the equipment you will use and how you will set it up.

4. Read the method on the next page carefully.

Method

1. Measure 40 cm^3 sulfuric acid into the 100 cm^3 beaker. The volume does not need to be very accurate, so you can use the graduations on the beaker.
2. Set up the tripod, gauze and heatproof mat. Heat the acid **gently** using the Bunsen burner until it is almost boiling. Turn off the Bunsen burner.
3. Use the spatula to add **small** amounts of copper (II) oxide powder. Stir with the glass rod.
4. Continue to add copper (II) oxide if you cannot see it when stirred. When the copper (II) oxide has reacted, the solution is clear blue.
5. Stop adding the copper (II) oxide when some of it remains after stirring. Allow the apparatus to cool completely.
6. Set up the filter funnel and paper over the conical flask. Use the clamp stand to hold the funnel.
7. Filter the contents of the beaker from step **3**.
8. When filtration is complete, pour the contents of the conical flask into the evaporating basin.
9. Evaporate this gently using a water bath (250 cm^3 beaker with boiling water) on the tripod and gauze. Stop heating once crystals start to form.
10. Transfer the remaining solution to the crystallising dish (evaporating dish). Leave this in a cool place for **at least 24 hours**.
11. Remove the crystals from the concentrated solution with a spatula. **Gently** pat the crystals dry between two pieces of filter paper. These are pure dry crystals of copper (II) sulfate.