

Your teacher may watch to see if you can...

- safely and correctly use apparatus.

## Aim

To prepare a sample of pure, dry, hydrated copper sulfate crystals starting from copper oxide.

### Apparatus

- eye protection
- 100 cm<sup>3</sup> conical flask
- 100 cm<sup>3</sup> beaker
- Bunsen burner
- gauze and tripod
- heat mat
- Petri dish or watch glass
- 100 cm<sup>3</sup> measuring cylinder
- evaporating basin
- spatula
- stirring rod
- filter funnel
- filter paper
- tongs
- water bath (set at 50 °C)
- dilute sulfuric acid
- copper(II) oxide

### Safety

Wear eye protection at all times.

## Method

- Pour about 20 cm<sup>3</sup> of dilute sulfuric acid into a conical flask.
- Place the conical flask into a water bath at 50 °C and heat for 3–4 minutes to allow the acid to heat up.
- Use the spatula to add a little copper oxide to the acid and stir or swirl the contents of the flask.
- Keep repeating step **C** until the black powder does not disappear after stirring. (This makes sure the copper oxide is in excess.)
- Return the mixture to the water bath for a few minutes (to make sure there is no more acid left).
- Filter the mixture into a beaker and pour into an evaporating basin.
- Place the evaporating basin on top of a beaker half full of water. Heat the beaker, evaporating basin and contents using a Bunsen burner on a blue flame.
- Heat until about half of the water has evaporated. Then allow the evaporating basin to cool.
- When cool, transfer the solution to a Petri dish or watch glass and leave for a few days to allow the water to evaporate.
- Observe the shape and colour of the copper sulfate crystals formed.



Step F



Step H

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Recording your results**

1 Describe the colour, shape and size of the copper sulfate crystals produced.

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2 Describe the appearance of:

a the sulfuric acid \_\_\_\_\_

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b the copper oxide \_\_\_\_\_

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c the solution at the end of the reaction. \_\_\_\_\_

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**Considering your results**

3 Write a word equation to show the reaction you have carried out.

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4 State why you need to be sure excess copper oxide is added in step D.

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5 What would happen in step E if there was still some acid left?

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6 Name the substance left in the filter paper in step F.

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7 What is dissolved in the solution that went through the filter paper?

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8 Explain why this is an example of a neutralisation reaction.

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9 What substance acts as a base in this reaction?

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10 Write a symbol equation to show the reaction you have carried out. Include the state symbols.

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