

# WJEC (Wales) Chemistry GCSE

## SP 2.2a - Preparation of Crystals of a Soluble Salt from an Insoluble Base or Carbonate

### Flashcards

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What acid and insoluble base are required to prepare a sample of zinc chloride?



What acid and insoluble base are required to prepare a sample of zinc chloride?

Hydrochloric acid

AND

Zinc oxide/carbonate/hydroxide



What acid and insoluble base are required to prepare a sample of copper(II) sulfate?



What acid and insoluble base are required to prepare a sample of copper(II) sulfate?

Sulfuric acid

AND

Copper(II) oxide/carbonate/hydroxide

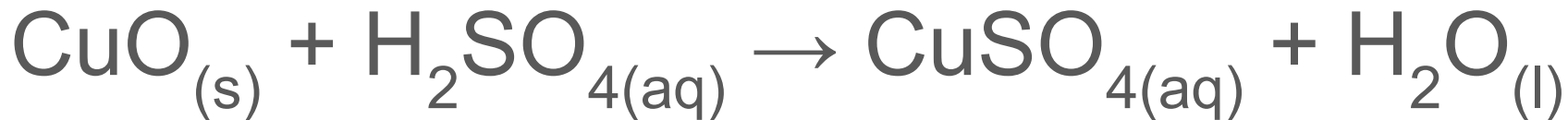


Give the chemical equation for the reaction between copper(II) oxide and sulfuric acid



Give the chemical equation for the reaction between copper(II) oxide and sulfuric acid

Copper(II) oxide + sulfuric acid → copper(II) sulfate + water



What apparatus is required to obtain a pure, dry sample of copper(II) sulfate from a sample of insoluble copper(II) oxide?





What apparatus is required to obtain a pure, dry sample of copper(II) sulfate from a sample of insoluble copper(II) oxide?

- Spatula
- Glass rod
- Measuring cylinder
- 250 cm<sup>3</sup> beakers
- Bunsen burner
- Tripod
- Gauze
- Heatproof mat
- Filter funnel and paper
- Small conical flask
- Evaporating basin



Outline the procedure to obtain a pure, dry sample of copper(II) sulfate from a sample of insoluble copper(II) oxide



Outline the procedure to obtain a pure, dry sample of copper(II) sulfate from a sample of insoluble copper(II) oxide

1. React sulfuric acid with excess copper(II) oxide.
2. Filter the mixture to remove the excess copper(II) oxide.
3. Heat the solution to start evaporation.
4. Turn off the heat and allow the solution to cool. Leave the solution to dry completely.



What are two ways of checking that all the sulfuric acid has reacted with copper(II) oxide?



What are two ways of checking that all the sulfuric acid has reacted with copper(II) oxide?

1. If all the sulfuric acid has reacted, then when you add more of the copper(II) oxide you can observe that it remains as a solid and does not react.
2. Dip a glass rod into the reaction mixture and then tap it on some blue litmus paper. The paper will turn red if there is still some acid present.



Why might the sulfuric acid be gently warmed before adding to the copper(II) oxide?



Why might the sulfuric acid be gently warmed before adding to the copper(II) oxide?

Warming the solution increases the temperature of the reactants. This will lead to a faster rate of reaction.



In filtration, which component is the filtrate and which component is the residue?





In filtration, which component is the filtrate and which component is the residue?

Filtrate - the solution which passes through the filter paper.

Residue - the solids left behind on the filter paper.



What safety precautions need to be considered when preparing a sample of copper(II) sulfate from copper(II) oxide and sulfuric acid?



# What safety precautions need to be considered when preparing a sample of copper(II) sulfate from copper(II) oxide and sulfuric acid?

- Sulfuric acid is corrosive. Wear safety goggles and wash the skin immediately if there is any contact. Sulfuric acid releases toxic fumes on heating. Ensure the experiment is carried out in a well ventilated room.
- When the Bunsen burner is not in use, turn it off or leave it on the orange safety flame. Tie hair back.
- Copper(II) oxide and copper(II) sulfate are both irritants. Avoid contact with the skin. On contact, wash skin immediately.



How can you separate an insoluble product from a solution?



# How can you separate an insoluble product from a solution?

## Filtration:

- Place filter paper in a funnel over a conical flask.
- Pour the mixture through the funnel.
- Insoluble product remains on the filter paper.



# How can you separate soluble solids from solution?



# How can you separate soluble solids from solution?

Evaporation:

- Pour the mixture into an evaporating dish.
- Slowly heat the solution.
- The solvent evaporates and the solution becomes more concentrated, which causes crystals to form.
- Keep heating the evaporating dish until the dish holds only the dry crystals.



How could you separate a soluble solid from a solution, if the solid decomposes when heated?





# How could you separate a soluble solid from a solution, if the solid decomposes when heated?

## Crystallisation:

- Gently heat the solution in an evaporating dish.
- When the crystals start to form, remove the dish from the heat and allow to cool.
- Once cold, filter the crystals out of the solution and leave them in a warm place to dry.

