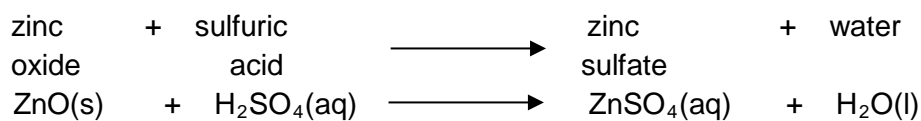


Preparation of useful salts (e.g. zinc sulfate)

Introduction

Zinc is important for growth and for the development and health of body tissues. Zinc sulfate is used to treat and to prevent zinc deficiency.

In this experiment you will produce the soluble salt, zinc sulfate from the reaction between a base, zinc oxide and sulfuric acid.



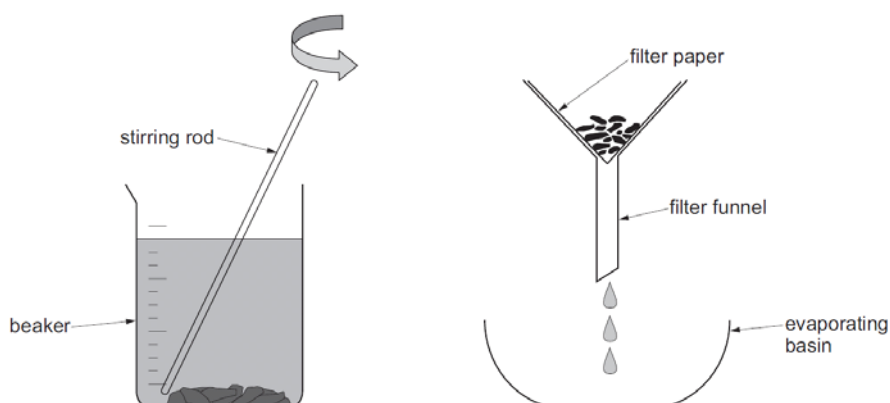
Apparatus

zinc oxide powder
 1 mol/dm³ sulfuric acid
 filter paper
 filter funnel
 50 cm³ measuring cylinder
 250 cm³ beaker
 Bunsen burner
 tripod and gauze
 thermometer
 evaporating basin

Access to:

electronic balance ± 0.01 g

Diagram of Apparatus



Method

1. Weigh between 4.4g and 5g of zinc oxide onto a clean, dry filter paper. Record the mass used.
2. Measure 50cm³ of the 1 mol/dm³ sulfuric acid into a 250cm³ beaker.
3. Heat the acid to approximately 50°C.
4. Add the zinc oxide and stir.
5. Let the mixture cool then filter into an evaporating basin.
6. Boil the mixture in the evaporating basin until half the liquid has evaporated.
7. Leave to evaporate to dryness.
8. Scrape as much of the solid as possible onto a clean filter paper.
9. Record the mass obtained.

Risk Assessment

| Hazard | Risk | Control measure |
|------------------------------|---|--|
| Sulfuric acid is an irritant | The acid could splash onto skin or eyes whilst stirring | Wear eye protection and ensure gentle stirring |
| Zinc sulfate is harmful | Could come into contact with the skin / eyes when stirring or evaporating | Wear eye protection and ensure gentle stirring |

Teacher / Technician notes

Reagents:

- Zinc oxide - Refer to CLEAPSS hazard 108B
- Zinc sulfate - Refer to CLEAPSS hazard 108
- Sulfuric acid [1.0 mol/dm^3] - Refer to CLEAPSS hazard 98A

This experiment provides a good opportunity to calculate percentage yield as an additional step.

If the mass is not to be weighed at the end, the quantities of zinc oxide and sulfuric acid could be halved.

Working scientifically skills covered

2. Experimental skills and strategies

Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.

Apply a knowledge of a range of techniques, instruments, apparatus and materials to select those appropriate to the experiment.

Carry out experiments appropriately having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.