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Preparation of a Salt

*UNIT 3 PPA 1*

**INTRODUCTION**

A salt is formed when the hydrogen ions of an acid are replaced by metal ions or ammonium ions. For example, if the hydrogen ions in sulphuric acid were replaced by magnesium ions then the salt magnesium sulphate would be formed.

The aim of this experiment is to prepare a pure sample of magnesium sulphate.

Making magnesium sulphate can be achieved in a number of ways. These include reacting an excess of magnesium or magnesium carbonate with sulphuric acid. An excess has to be used to make sure all the acid is used up. If any acid remained then the salt would be impure.

The fact that a gas is produced on reacting magnesium or magnesium carbonate with an acid allows us to tell when all the acid has been consumed. At this point no more bubbles of gas will appear and the excess magnesium or magnesium carbonate will remain as a solid in the reaction mixture.

Decide which method you will use to make magnesium sulphate (reacting magnesium with sulphuric acid or reacting magnesium carbonate with sulphuric acid) and then proceed as outlined below.

**Each group will need**

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| measuring cylinder | small glass beaker |
| glass rod | filter funnel and paper |
| conical flask | evaporating basin |
| tripod | Bunsen burner and heating mat |
| hand lens | dilute sulphuric acid |
| magnesium turnings or magnesium carbonate |  |

**Safety**

Wear eye protection.

Avoid breathing in any acid mist.

**Procedure**

1. Using a measuring cylinder add 20 cm3 of dilute sulphuric acid to the beaker.
2. Add a spatulaful of magnesium or magnesium carbonate to the acid and stir the reaction mixture with the glass rod.
3. If all the solid reacts add another spatulaful of magnesium or magnesium carbonate and stir the mixture.
4. Continue adding the magnesium or magnesium carbonate until no more bubbles of gas are produced and some of the solid remains unreacted.
5. Place the filter funnel in the neck of the conical flask. Fold the filter paper and insert it in the funnel.
6. Carefully pour the reaction mixture into the filter paper.
7. When the filtration is complete, transfer the salt solution from the conical flask into the evaporating basin.
8. Place the evaporating basin on the tripod and carefully heat the salt solution until about half the water has boiled off.
9. Let the basin cool before transferring it to a safe place. Leave it until your next lesson to allow the solution to crystallise slowly.
10. Transfer the crystals onto a piece of filter paper. Examine them with a hand lens and draw one of the crystals.

**Results sheet**

*State the aim of the experiment indicating the names of the chemicals used to make the salt.*

**Procedure**

*Why was an excess of magnesium or magnesium carbonate added to the acid?*

*The three steps involved in preparing magnesium sulphate are the 'reaction' step, the*

*'filtration' step and the 'evaporation' step.*

*Label the diagrams which illustrate the 'reaction' step and the 'evaporation' step*

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**Results**

*Draw a crystal of magnesium sulphate.*

**Conclusion**

*\* Write a word equation for the reaction you carried out to prepare the salt*