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| **Foundation Year** | **Finding the formula of magnesium oxide** | **Semester 1** |

**Finding the formula of magnesium oxide**

**Aim**

To determine the formula of magnesium oxide.

**Introduction**

When magnesium is heated in air, it reacts with oxygen. During this oxidation reaction, magnesium oxide is produced increasing the mass of the material from that of the reactant. If the mass of magnesium at the start, and the mass of magnesium oxide produced at the end are both known, the mass of oxygen which has been combined with the magnesium can be determined. These masses can then be used to work out the formula of magnesium oxide.

**Skills associated with this practical**

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| **Practical Skills**   * Correct use of a top pan balance * Correct use of a Bunsen burner * Heating in a crucible * Using tongs to handle hot apparatus | **Scientific Skills**   * Drawing a results table * Carrying out mole calculations |

**Signposts**

Chemistry, Conoley & Hills, 3rd Edition, Chapter 21, page 419

**Understanding hazard, minimising risk**

You must stand up throughout the practical, and safety glasses must be worn at ALL times in the lab. You must wear a labcoat whilst you are carrying out ALL practical work. Long hair must be tied back, and trousers (jeans are OK) must be worn. Open-toed shoes and clothing revealing bare skin are not permitted.

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| Substance | Amount | Hazards | Minimising Hazards | Disposal / Spillage |
| Magnesium ribbon | ~10 cm strip | Flammable, harmful if swallowed, inhaled, contact with skin. | Wear goggles, gloves, lab coat. | Dispose of in solid waste container. |

**Procedure**

Apparatus

PER PAIR: Tripod Bunsen burner

Clay-pipe triangle Crucible and lid

10 cm Magnesium ribbon Heat resistant mat

Tongs Sandpaper

Method

1. Using tongs to handle them, weigh the empty crucible with its lid and write down their combined mass in results table drawn in your lab notebook. You will take a photo of your completed results table at the end of the experiment and submit it for your *Skills Portfolio*.
2. Clean the piece of magnesium ribbon with sandpaper then coil it loosely round a pencil. Using tongs, put the magnesium ribbon into the crucible and put the lid on.
3. Handling only with tongs, weigh the crucible, lid and magnesium together and write down their combined mass in your results table.
4. Handling only with tongs, put the crucible onto the clay-pipe triangle; leave the lid slightly ajar. Take a photo of the apparatus for your *Skills Portfolio*.
5. Heat the crucible gently for the first minute, then more strongly (blue flame). Record your observations.
6. Continue heating the crucible until the magnesium ribbon visible glows and then heat for a further 10 minutes.\* Ask your laboratory partner to take a photo of you using the tongs for your *Skills Portfolio*.
7. Turn the Bunsen burner off when you have finished heating.
8. Ensure that the final mass of the crucible with the lid and contents is recorded in in your table and that you calculate and record the final mass of the product of the reaction. Take a photo of your results table for your *Skills Portfolio*.

\***Note: If at any point you weigh the crucible and contents after heating, you should let the apparatus fully cool before moving it to a balance. Ask for advice from a demonstrator.**

**Analysis and questions – you will be required to enter your answers into Labdog**

1. Work out the mass of magnesium (reactant) used in the experiment.
2. Work out the mass of magnesium oxide (product) formed.
3. Use your answers to (1) and (2) to work out the mass of oxygen gained during the reaction.
4. Using the masses calculated in (1) and (3), and the molar masses of magnesium and oxygen, calculate the number of moles of magnesium and oxygen involved.
5. Work out your formula for magnesium oxide (round to 1 decimal place).
6. Explain why your formula might be different from the accepted one for magnesium oxide.

**Deadlines, Assessment and Feedback on Performance**

You are required to complete the *Skills Portfolio* document associated with this practical. This should be completed electronically with all photos inserted in the appropriate places and accompanying text typed in. The submission deadline for *Skills Portfolios* will normally be midnight on the Sunday following the practical, although you will be given specific guidance during the practical session. Submission is via the e-submission system Turnitin which you will be able to access in the appropriate folder in the Laboratories and Coursework Blackboard course.