

MAGNESIUM OXIDE PRODUCTION

Objectives: In this investigation, you will

- prepare magnesium oxide,
- calculate the percent composition of your product, and
- determine the product's empirical and molecular formulas.

Equipment:

crucible and cover	tongs
Bunsen burner	clay triangle
ring stand	iron ring
wash bottle	glass stirring rod
15 cm Mg ribbon	analytic balance
distilled water	GOGGLES

Procedure:

1. Wash and dry your hands (moisture on your hands will react with the magnesium ribbon).
2. Record the mass of a clean, crucible and cover.
3. Obtain a piece of magnesium ribbon approximately 10 cm long from your instructor and scrape both sides of the magnesium with the scissor blade to remove corrosion (when the corrosion is removed the Mg will appear shiny). Coil the Mg loosely around a pencil. Remove the pencil, place the magnesium in the crucible and record the mass of the magnesium, crucible and lid.
4. Place the crucible, cover and magnesium on a clay triangle as shown by teacher.
5. Adjust the crucible and cover on the clay triangle so that the lid is ajar. This position will allow a steady flow of air into the evaporating dish. Heat the dish gently for 3 minutes then strongly for at least 10 minutes. (Be sure that the magnesium ignites at some point)
CAUTION: *Do not look directly at the burning magnesium.* Allow the dish to cool for 5 minutes.
6. Repeat procedure #5 (but only heating for about 2 minutes) until successive weighings are in agreement to within .02g.

ANALYSIS: Show all measurements and calculated numbers in the spaces provided in the data table. (Show units and substance symbol or formula for each measurement taken or number calculated.)

	Measurement
mass of dish, cover, and Mg before heating	
mass of empty dish and cover	
mass of magnesium	
mass of dish, cover and residue after heating	
mass of residue (magnesium oxide produced)	
Mass of oxygen	
moles of oxygen in the magnesium oxide residue	
moles of magnesium in the magnesium oxide residue	

Calculations:

1. Calculate the percent composition of magnesium oxide (write the predicted formula by balancing the charges of the Mg ion and the O ion, then find the percent composition by mass of each element).

2. From your measured value of the mass of residue in your data table, calculate the moles of magnesium and of oxygen in your sample of residue.

3. Using the moles calculated above; calculate the empirical formula for your sample of magnesium oxide.

4. Using the empirical formula found above, what is its molecular formula if the molar mass is 40.3 g/mol?

5. Does the magnesium in your crucible gain or lose mass? Explain.

6. How would your final ratio change if not all of the magnesium had reacted?

7. Does your calculated formula for magnesium match the predicted formula? (from question #1)

8. Explain any error you may have had.

