

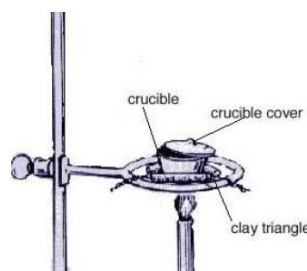
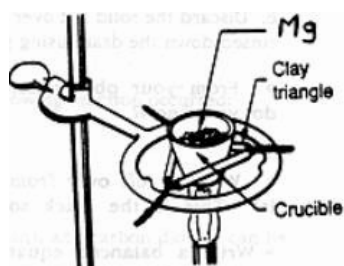
Mole Lab #3: MAGNESIUM OXIDE PRODUCTION; SC2c

Purpose: In this lab 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 (dH₂O), lab safety regalia

Procedure:

1. Wash and dry your hands (moisture on your hands will react with the magnesium ribbon).
2. Record the mass of a clean, dry crucible and cover.
3. Obtain a piece of magnesium ribbon approximately 15 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 = luster). 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 in the figures below.



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 crucible. Heat the crucible gently for 3 minutes then strongly for 5 minutes.

CAUTION: Do not look directly at the burning magnesium. Allow the crucible to cool for 5 minutes.

CAUTION 2: Do not add cold water to a hot crucible: It will crack!!

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.)

Data Table	Measurement
mass of crucible, cover, and Mg before heating	
mass of empty crucible and cover	
mass of magnesium	
mass of crucible, 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	

Questions and Calculations:

Q1. Calculate the percent composition of magnesium oxide (write the formula, balancing the charges of the Mg ion and the O ion, then find the percent composition by mass).

Q2. 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.

Q3. Using the moles calculated above; calculate the empirical formula for your sample of magnesium oxide.

Q4. Using the empirical formula found above, what is its molecular formula if the molar mass is 40.3 g/mol?

Q5. Does the magnesium in your crucible gain or lose mass? Explain.

Q6. How would your final ratio change if not all of the magnesium had reacted?

Q7. How would your final ratio change if there were still some water in the crucible after you stopped heating it?

Q8. Does your calculated formula for magnesium oxide match the predicted formula (Q3)? Explain.

