

Name: _____ Date: _____ Per. _____

LAB: Percent Yield of Magnesium Oxide

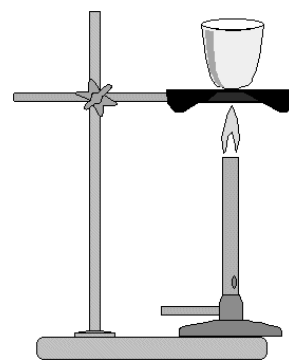
PURPOSE:

In this experiment, you will determine the **percent yield** when solid magnesium metal and oxygen gas (O₂) react to form solid magnesium oxide (MgO). Since mass is conserved, the amount of oxygen that is added to the magnesium upon bonding can be calculated.

PRELAB: Write a complete **balanced** equation for the reaction below. (include STATES of each reactant / product)

PROCEDURE:

- 1) Heat the crucible for two minutes to dry then allow to cool for three minutes.
- 2) Using tongs, measure and record the mass of the empty crucible in the data table.
- 3) Add your piece of magnesium metal to the crucible. Record the mass of the magnesium and crucible, then calculate the mass of the magnesium in the data table.
- 4) Note the physical appearance of the magnesium metal.
- 5) Light the Bunsen Burner and set up the crucible above the burner so that the hottest portion of the flame touches the bottom of the crucible.
- 6) Continue heating the crucible for 14 minutes. Watch for signs of a chemical change!
- 7) ***Allow the crucible to cool for 5 full minutes!***
- 8) Measure the mass of the crucible and Magnesium Oxide; record in your data table.
- 9) Calculate the mass of the magnesium oxide (MgO) produced by subtracting the mass of the empty crucible from the mass of the crucible and MgO product.
- 10) Calculate the mass of oxygen that was added to the magnesium. (see hint in data table)



DATA TABLE: (denotes a CALCULATED VALUE)**

Mass of empty crucible:	
Mass of crucible + magnesium metal:	
**Mass of magnesium metal:	
Mass of MgO and crucible after heating:	
**Mass of MgO produced:	
**Mass of oxygen gas (O ₂) added to the dish: (Mass of MgO produced – Mass of Mg metal)	

POST-LAB:

1) To find the **theoretical value** of magnesium oxide (MgO) that should have been produced, place the mass of your magnesium into the formula below, and multiply by 1.7.

THEORETICAL YIELD = _____g Mg x (1.7) = _____g MgO produced

2) Using the theoretical yield (calculated above in #1) and the actual yield of MgO produced in the lab (see your data table), calculate the % yield and % error, including units. **SHOW YOUR WORK!**

% YIELD = $\frac{\text{actual yield}}{\text{theoretical yield}}$ x 100 =

% ERROR = $\frac{|\text{actual yield} - \text{theoretical yield}|}{\text{theoretical yield}}$ x 100% =

3) Were the changes you observed from the copper to the NEW Product physical or chemical? (Explain how you know!)

4) How and why did the mass of the crucible contents change after heating? (Did they gain or lose mass, and why?)

5) Classify each substance from this activity (listed below) as an **element**, **compound**, **homogeneous mixture**, or **heterogeneous mixture**:

- Magnesium Metal (Mg) = _____
- Oxygen Gas (O₂) = _____
- Magnesium Oxide after heating (MgO) = _____
- Your face (☺) = _____

6) Balance the following equations:

