Name
Date **Period**

Grade:

Lab 25
DETERMINING AN EMPIRICAL FORMULA

PRELAB QUESTIONS

1. Define; mole, molecular formula, molar mass, empirical formula, Law of Definite proportions.

2. What is the mass of 2.5 moles of $Al_2(SO_4)_3$?

How many moles are there in 3.4 X 10^{-3} g of $Ca(OH)_2$; how many moles in 1.2 X 10^{24} molecules of H_20?

NAME ____ PERIOD ____________

DATE: ____________________ LAB PARTNERS:

EXPERIMENT 25
DETERMINING AN EMPIRICAL FORMULA

OBSERVATIONS AND DATA

(A) Mass of empty crucible. g

(B) Mass of crucible. + Mg g

(C) Mass of crucible. + Magnesiumoxide g

(D) Odor of vapor in step 6:

CALCULATIONS

1. Find the mass of magnesium used (B) - (A) g

2. Find the mass of oxygen that reacted (C) - (B) g

3. Find the number of moles of Mg used:

$$\text{moles Mg} \ \frac{\text{Mass of Mg in g}}{\text{24.3 g Mg/mole Mg}}$$ moles

4. Find the number of moles of 0 that reacted:

$$\text{Moles O} \ \frac{\text{mass of 0 in g}}{\text{14.0 g O/moles 0}}$$ moles

5. Find the simplest whole number ratio of moles of Mg to moles of O:

CONCLUSIONS AND QUESTIONS

1. Write the empirical formula of the oxide of magnesium based on your calculations from this experiment.

2. What is the ratio of the mass in grams of magnesium used to the mass in grams of oxygen that reacted? Relate this ratio to the Law of Definite Proportions.

3. Why is the ratio found in question 2 different from the ratio found in calculation 5 above?

4. In a chemical formula, explain the significance of subscripts in terms of atoms and molecules.

5. The molecular formula of hydrogen peroxide is H_2O_2. What is its empirical formula?

6. How is the chemical composition of carbon monoxide, CO, similar to that of carbon dioxide, CO_2? How is it different?

7. A sample of sulfur having a mass of 1.26 g combines with oxygen to form a compound with a mass of 3.20 g. What is the empirical formula of the compound? Show all calculations.

8. The correct empirical formula for Magnesium oxide is MgO. Using your mass of the magnesium, determine the expected mass of the MgO and compare it to the experimental value. Calculate the % error.

Discussion

Conclusion