Name _____

Determining the Empirical Formula of Magnesium Oxide
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Always wear safety goggles and a lab apron to protect your eyes and clothing. If you get a chemical in your eyes, immediately flush the chemical out at the eyewash station while calling to your teacher. Know the locations of the emergency lab shower and the eyewash station and the procedures for using them.

When using a Bunsen burner, confine long hair and loose clothing. If your clothing catches on fire, WALK to the emergency lab shower and use it to put out the fire. When heating a substance in a test tube, the mouth of the test tube should point away from where you and others are standing. Watch the test tube at all times to prevent the contents from boiling over.

Never put broken glass in a regular waste container. Broken glass should be disposed of separately according to your teacher's instructions.

INTRODUCTION
This gravimetric analysis involves the combustion of magnesium metal in air to synthesize magnesium oxide. The mass of the product is greater than the mass of magnesium used because oxygen reacts with the magnesium metal. As in all gravimetric analyses, success depends on attaining a product yield near 100%. Therefore, the product will be heated and cooled and have its mass measured until two of these mass measurements are within 0.02% of one another. When the masses of the reactant and product have been carefully measured, the amount of oxygen used in the reaction can be calculated. The ratio of oxygen to magnesium can then be established, and the empirical formula of magnesium oxide can be determined.

OBJECTIVES
- **Measure** the mass of magnesium oxide.
- **Perform** a synthesis reaction by using gravimetric techniques.
- **Determine** the empirical formula of magnesium oxide.
- **Calculate** the class average and standard deviation for moles of oxygen used.

MATERIALS

PROCEDURE

RESULTS

Data Table				
	Trial 1	**Trial 2**	**Trial 3**	**Average**
1. Mass of crucible, lid, and metal (g)				
2. Mass of crucible, lid, and product (g)				
3. Mass of crucible and lid (g)				

ANALYSIS
1. Calculate the mass of the magnesium metal and the mass of the product.
2. Determine the mass of the oxygen consumed.
3. Write the balance equation for the formula.
4. Calculate the number of moles of magnesium and the number of moles of oxygen in the product.

CONCLUSIONS
1. Define empirical formula.
2. How does empirical formula differ from a chemical formula?
3. Determine the empirical formula for magnesium oxide, Mg_xO_y.