



Name: _____ Period: _____

Assigned on Wednesday, October 29, 2025

11.2 Lab: Percent Yield for the Burning of Magnesium

Due Monday, November 03, 2025

Objective

Use experimental evidence to determine the meaning of percent yield and explain why the percent yield of reactions is expected to be less than 100%.

Procedure

1. Attain a sample of magnesium.
2. Write the balanced equation for the burning of magnesium.
3. Find the mass of your magnesium sample.
4. Using stoichiometry, calculate the theoretical mass of product produced when you burn your entire magnesium sample.
5. Using crucible tongs, hold the magnesium strip in the Bunsen burner flame and ignite your sample. Hold the burning metal over a watch glass to collect the product in the watch glass. (Do not look directly at the flame! You must wear goggles while burning the magnesium.)
6. Write down your observations of the reaction. Be thorough!
7. Find the mass of the product using a balance. How does this mass compare to your calculated value?
8. Calculate the percent yield. (Use your book or the internet to find out how to do this!)
9. Discuss why your percent yield is less than 100% giving at least two good reasons.

Data and Calculations: Show all work for any calculated values, showing all units and rounding for significant figures.

Balanced equation for the burning of magnesium: _____

Mass of magnesium sample: _____ g

Theoretical (calculated) mass of product: _____ g

Observations: _____

Actual (experimental) mass of product: _____ g

Calculated Percent Yield: _____

Analysis and Application

1. Discuss why your percent yield is less than 100% giving at least two good reasons.

2. If you burned 34.6 g of magnesium, a) what mass of product would you expect to collect if you had a 100% yield, and b) what mass of product would you expect given the percent yield you calculated?

Practice

Show all work including units and rounding for the correct significant figures.

1. In a particular reaction, the theoretical yield was 20.0 grams and the actual yield was 17.2 grams. What was the percent yield for the reaction?
2. The percent yield for a reaction was 92.67% when the actual yield was 4.23 g. What was the theoretical yield?
3. A major source of sodium metal is decomposing sodium chloride into sodium metal and chlorine gas.
 - a) What is the theoretical yield of sodium metal that can be attained by decomposing 82,500 g of sodium chloride?
 - b) If you experimentally decompose 82,500 g of sodium chloride and only produce 29,400 g of sodium, what was the percent yield?
4. Consider the following reaction: $\text{Al} + \text{HCl} \rightarrow \text{AlCl}_3 + \text{H}_2$ (**note: this is unbalanced.**)
 - a) How many grams of aluminum chloride are produced when 12.0 grams of aluminum react with excess hydrochloric acid assuming a 100% yield?
 - b) If the reaction only has a 75.0% yield, what mass of aluminum would be needed to produce the same mass of aluminum chloride as the previous problem?