# G $ \rightarrow $M $ \rightarrow $M $ \rightarrow $G

# Bellwork:

 When 1.2 grams of magnesium metal is dropped into 0.1 mol of hydrochloric acid, how much magnesium chloride is produced?

# Vocab and tools:

 *Your description based on the video Your chemistry description*

|  |  |  |
| --- | --- | --- |
| Theoretical yield |  |  |
| Actual yield |  |  |

*Example problem:*

An experimental procedure asks you to react 15.5 g of NH4Cl with an excess of AgNO3. In the reaction 35.5 g AgCl is produced. What is the percent yield?

 NH4Cl + AgNO3 🡪 AgCl + NH4NO3

 Percent yield: $ \frac{Mass of actual yield}{Mass of theoretical yield}×100\%$

Percent error: $\frac{\left|theoretical yield-actual yield\right|}{theoretical yield}×100\%$

1. Given a hydrogen fuel cell reaction where 11.3 grams of water are expected to be released, what is the percent yield if the fuel cell actually releases 8.44 g of water? What is the percent error?

$$Percent yield= \frac{8.44 g H\_{2}O}{11.3 g H\_{2}O}×100\%=74.7\%$$

2. In the decomposition reaction of calcium carbonate, CaCO3, if 20.7 grams of CaCO3 produces 6.81 grams of CaO, what is the percent yield?

a. Balanced chemical equation: \_\_\_\_CaCO3 $ \rightarrow $\_\_\_\_ CaO + \_\_\_\_\_CO2

1 CaCO3 $ \rightarrow $ 1 CaO + 1 C

b. Theoretical yield of CaO given that 20.7 g CaCO3 was used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$$20.7g CaCO\_{3}×\frac{1 mol CaCO\_{3}}{100.09 g CaCO\_{3}}×\frac{1 mol CaCO }{1 mol CaCO\_{3}}×\frac{68.09 g CaCO }{1 mol CaCO}=14.1 g CaCO$$

 c. Percent yield of CaO: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

$$Percent yield= \frac{6.81 g CaO}{14.1 g CaO}×100\%=48.3\%$$

3.   For the balanced equation shown below, if the reaction uses 0.112 grams of Fe3O4 and actually produces 0.059 grams of Fe, what is the percent yield of Fe?

 Fe3O4 + 4 H2$ \rightarrow $3 Fe + 4 H2O

4.   How many grams of H2O are produced from burning 40.8 grams of C6H6O3 in the presence of oxygen, given that 39.0% yield is obtained?

 \_\_\_\_C6H6O3 + \_\_\_\_O2$ \rightarrow $\_\_\_CO2 + \_\_\_\_H2