**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mass-Mass Relationships #1**

**Date\_\_\_\_\_\_\_\_\_\_\_**

***Example:***

How many grams of Copper(II) nitrate would be produced from 4.30 g of copper metal reacting with excess nitric acid according to the following equation:

Cu + 4HNO3 🡪 Cu(NO3)2 + 2NO2 + 2H2O

1. When copper(II) nitrate reacts with sodium hydroxide, copper(II) hydroxide is produced. How many grams of Cu(OH)2 can be prepared from 12.7 g of Cu(NO3)2 and excess NaOH?

2. When Cu(OH)2 is heated, it decomposes to black CuO and H2O. How many grams of CuO will be formed from the decomposition of 6.59 g of Cu(OH)2?

3. When 5.37 g of the black copper(II) oxide are mixed with excess sulfuric acid, the solution turns a clear blue, indicating the formation of copper(II) sulfate. How many grams of copper(II) sulfate will be formed in this double displacement reaction?

4. If an excess of zinc metal is placed in a copper(II) sulfate solution, the zinc will displace the copper. If 10.8 g of copper(II) sulfate is reacted, how many grams of copper metal will be recovered from the solution? (Hint: Zn + CuSO4 🡪 ZnSO4 + Cu)

5. Compare the amount of copper that was recovered in problem 4 to the amount of copper with which you began this series of reactions in the example. Explain any differences.

**CHEMISTRY A NAME**

**MASS-MASS PROBLEMS #2 PERIOD\_\_\_\_**

1. How many grams of H2 can be produced from the reaction of 11.5 grams of sodium with an excess of water?
2. An excess of nitrogen reacts with 2.00 grams of hydrogen. How many grams of ammonia (NH3) are produced?
3. How many grams of oxygen are required to completely burn 85.6 grams of carbon?
4. In problem 3, how many grams of CO2 will be formed?
5. In the decomposition of potassium chlorate, 64.2 grams of O2 are formed. How many grams of potassium chloride are produced?
6. The action of carbon monoxide on iron(III) oxide can be represented by the equation, Fe2O3 + 3CO 2Fe + 3CO2. What would be the minimum amount of carbon monoxide used if 18.7 grams of iron were produced?
7. How many grams of hydrochloric acid are required to react completely with 75.1 grams of calcium hydroxide?
8. How many grams of hydrogen are produced when 5.62 grams of aluminum react with excess hydrochloric acid?