Chemistry 11

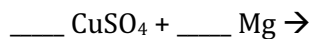# Stoichiometry I, II, & III Review

Name:
Date:
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Show all steps and calculations in the space provided below.

1. Consider the following reaction:

$$\_\_\_\_ \ CuSO_4 + \_\_\_\_ \ Mg \rightarrow$$

   a. Predict the products and balance the chemical reaction

   b. What is the mole ratio between magnesium and copper?

   c. If 12.7g of magnesium reacted, how many grams of copper were produced?

   d. What volume of 1.72M copper (II) sulphate was needed for this reaction?

2. Consider the following reaction that occurs at STP:

$$\_\_\_\_ \ Cu + \_\_\_\_\_ \ HNO_3 \rightarrow \_\_\_\_ \ Cu(NO_3)_2 + \_\_\_\_\_ \ NO_2 + \_\_\_\_ \ H_2O$$
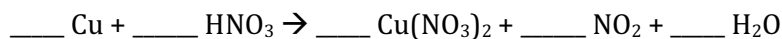
   a. What is the mole ratio between nitric acid and water?

   b. If 5.0g of copper reacted, how many liters of nitrogen dioxide gas were produced?

   c. How many grams of water were produced?

    d. How many molecules of copper (II) nitrate were produced?

3. Consider the following reaction: copper (II) nitrate reacts with sodium hydroxide to produce copper (II) hydroxide and sodium nitrate
    a. Write a balanced chemical formula to describe the reaction.

    b. If 0.059g of copper (II) nitrate were used for this reaction, what mass of sodium nitrate would be produced?

    c. How many mL of 0.10M sodium hydroxide would be needed for this reaction?

    d. How many atoms of hydrogen would be produced?

1a. $MgSO_4$ + Cu 1b. 1:1 1c. 33.2g Cu 1d. 0.304 L $CuSO_4$ 2a. 4:2 2b. 3.5L NO_2 2c. 2.8g H_2O 2d. 4.7×10^{22} molecules $Cu(NO_3)_2$
3a. $Cu(NO_3)_2$ + 2NaOH → $Cu(OH)_2$ + 2NaNO$_3$ 3b. 0.053g NaNO$_3$ 3c. 6.3mL NaOH 3d. 3.8×10^{20} atoms H