Name:_____ Date: _____

1. Calculate the molar mass in grams of each of the following:
   a. Na
   b. Br_2
   c. $CaCl_2$
   d. C_2H_5OH

2. Calculate the number of moles of atoms in:
   a. 23 g of sodium
   b. 64 g of sulfur
   c. 7 grams of iron
   d. 20 g krypton

3. State the number of moles in:
   a. 58.5 g sodium chloride
   b. 50 g of $CaCO_3$
   c. 499 g of $CuSO_4$
   d. 303g of Potassium Nitrate

4. Given Avogadro's Number 6×10^{23}, calculate the number of atoms in:
   a. 48 g of Magnesium
   b. 336 g of iron

5. Calculate the mass of the following samples:
   a. 5 mol sodium chloride
   b. 50 mol of $CaCO_3$
   c. 43 mol of $CuSO_4$
   d. 3.03×10^{-3} mol of Potassium Nitrate

$$N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$$

1. How many moles of hydrogen are needed to react completely with two moles of nitrogen?

2. How many grams of hydrogen are necessary to react completely with 50g of nitrogen, and how much ammonia will be produced?

Limiting Reactants Practice

1. Forty grams of magnesium is reacted with an excess of oxygen. How much oxygen is used in the reaction?

2. In a container, 100 grams of iron is combined with 100 grams of oxygen to form iron (II) oxide.
   a. How much iron (II) oxide is produced?

   b. Which element is the limiting reactant? _____

   c. How much of the excess reactant does not react?

3. Seventy grams of silver are allowed to react with 50 grams of bromine to form silver bromide, a compound found in eyeglass lenses.
    a. How much silver bromide is produced?

    b. Which element is the limiting reactant? _____

    c. How much of the excess reactant does not react?

4. In a container, 30 grams of potassium is combined with 25 grams of nitrogen and potassium nitride is formed.
    a. How much potassium nitride is formed?

    b. What is the limiting reactant? _____

    c. How much of the excess reactant remains?

Predicting Products Practice

Complete the following word equations and then write a balanced molecular equation.
Identify the reaction type to the left of the arrow. If no reaction is to take place write NR after the yield arrow.

1. Lead + mercury (II) sulfate →

2. Copper (II) sulfate + lead (II) nitrate →

3. Lead (II) nitrate + potassium iodide →

4. Sodium + magnesium phosphate →

5. Zinc chlorate + magnesium →

6. Barium chloride + sulfuric acid →

7. Barium chloride + nitric acid →

8. Zinc + magnesium hypochlorite →

9. Calcium chloride + silver nitrate →

10. Gold (III) nitrate + silver →

Name _____ Date _____ Period _____

Stoichiometry Ws # 2: Stoichiometric Conversions

1. Copper I oxide solid is produced in a combination reaction with solid copper and oxygen gas
   a. Write a balanced chemical equation for this reaction.

   b. How many moles of copper are needed to produce 13 moles of copper I oxide?

   c. How many moles of copper I oxide would be produced if only .25 moles of oxygen were available?

   d. You produced 11.7 grams of copper I oxide. How many grams of oxygen did you need?

2. Iron III oxide will decompose in the presence of hydrogen gas and heat to produce free iron and water.
   a. Write a balanced equation for the reaction.

   b. What mass of iron is produced when 450.0 grams of iron III oxide decomposes?

   c. How many moles of hydrogen gas are needed to produce 90.0 grams of iron?

   d. How many grams of water will be produced when .01 moles of iron III oxide decomposes?

3. Solid calcium combines with oxygen gas to form solid calcium oxide.
   a. Write a balanced equation for the reaction.

   b. How many moles of calcium oxide would be produced if only .33 moles of oxygen were available?

   c. If 4.5 grams of oxygen were used, how many grams of calcium are needed for the reaction to go to completion?

4. The combustion of butane gas is used in many hand held lighters
   a. Write a balanced chemical equation for the reaction.

   b. How many moles of oxygen are required to burn 4.8 moles of butane completely?

   c. How many grams of CO_2 are produced when 88g of O_2 react with an excess of butane?

6 Sodium Chloride can be split into its elements by electrolosis.
   a. Write a balanced chemical equation for this reaction.

   b. How many moles of chlorine gas are produced when 40.0g of salt is split by electrolosis?

   c. How many moles of sodium is produced when 5 moles of NaCl is split?

7. The complete combustion of liquid ethanol, C_2H_5OH, is used in alcohol burners.
   a. Write a balanced chemical equation for this reaction.

   b. How many grams of water are produced in the complete combustion of 100.0 grams of ethanol?

   c. In the complete combustion of ethanol, how many moles of oxygen are necessary to produce 18 moles of carbon dioxide?

   d. In the complete combustion of ethanol, how many grams of carbon dioxide are produced when 1.2 moles of water is produced?

8. Aqueous solutions of barium nitrate and ammonium carbonate react in a double replacement reaction.
   a. Predict the products and write the balanced equation for the reaction.

   b. How many moles of ammonium nitrate will be produced form 110.0 grams of ammonium carbonate?

   c. How many moles of barium carbonate would be produced from 6 moles of ammonium carbonate?

   d. How many grams of barium nitrate are needed to react with 220.0 grams of ammonium carbonate?