Stoichiometry Worksheet

~~1. Given the following equation: $2\ C_4H_{10} + 13\ O_2 \rightarrow 8\ CO_2 + 10\ H_2O$, show what the following molar ratios should be.~~

~~a. C_4H_{10} / O_2~~
~~b. O_2 / CO_2~~
~~c. O_2 / H_2O~~
~~d. C_4H_{10} / CO_2~~
~~e. C_4H_{10} / H_2O~~

2. Given the following equation: $2\ KClO_3 \rightarrow 2\ KCl + 3\ O_2$

How many moles of O_2 can be produced by letting 12.00 moles of $KClO_3$ react?

3. Given the following equation: $2\ K + Cl_2 \rightarrow 2\ KCl$

How many grams of KCl is produced from 2.50 g of K and excess Cl_2. From 1.00 g of Cl_2 and excess K?

4. Given the following equation: $Na_2O + H_2O \rightarrow 2\ NaOH$

How many grams of NaOH is produced from 1.20×10^2 grams of Na_2O? How many grams of Na_2O are required to produce 1.60×10^2 grams of NaOH?

5. Given the following equation: $8\ Fe + S_8 \rightarrow 8\ FeS$

What mass of iron is needed to react with 16.0 grams of sulfur? How many grams of FeS are produced?

6. Given the following equation: 2 $NaClO_3$ ---> 2 NaCl + 3 O_2

12.00 moles of $NaClO_3$ will produce how many grams of O_2? How many grams of NaCl are produced when 80.0 grams of O_2 are produced?

7. Given the following equation: Cu + 2 $AgNO_3$ ---> $Cu(NO_3)_2$ + 2 Ag

How many moles of Cu are needed to react with 3.50 moles of $AgNO_3$? If 89.5 grams of Ag were produced, how many grams of Cu reacted?

8. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). If 25.0 kilograms of pure Fe_2O_3 is used, how many kilograms of iron can be produced? The reaction is: Fe_2O_3 + 3 C ---> 2 Fe + 3 CO

9. The average human requires 120.0 grams of glucose ($C_6H_{12}O_6$) per day. How many grams of CO_2 (in the photosynthesis reaction) are required for this amount of glucose? The photosynthetic reaction is: 6 CO_2 + 6 H_2O ---> $C_6H_{12}O_6$ + 6 O_2

This problem is slightly different from those above.

10. Given the reaction: 4 NH_3 (g) + 5 O_2 (g) ---> 4 NO (g) + 6 H_2O (l)

When 1.20 mole of ammonia reacts, the total number of moles of products formed is:

a. 1.20 b. 1.50 c. 1.80 d. 3.00 e. 12.0

Academic Chemistry Limiting Reagents Wkst 2 Name: _____

1. Chlorine and fluorine react to form gaseous chlorine trifluoride. You start with 1.75 mol chlorine and 3.68 mol fluorine. Identify the limiting reagent and the excess reagent. Then determine how many mols of product are formed. And finally determine the number of mols of excess reagent remaining after the reaction.

2. A gaseous mixture containing 7.50 mol hydrogen gas and 9.00 mol chlorine gas reacts to form hydrogen chloride gas. Identify the limiting reagent and the excess reagent. Then determine how many mols of product are formed. And finally determine the number of mols of excess reagent remaining after the reaction.

3. The space shuttle uses aluminum metal and ammonium perchlorate in its reusable booster rockets. The products of the reaction are aluminum oxide, aluminum chloride, nitrogen monoxide, and steam. The reaction mixture contains 5.75g aluminum and 7.32g of ammonium perchlorate.

Write the balanced chemical equation.

Identify the limiting reagent and the excess reagent. Then determine how many grams of aluminum chloride are formed. And finally determine the number of grams of excess reagent remaining after the reaction.

If 1.87g of aluminum chloride is actually collected, what is the percent yield?

4. Oxyacetylene torches used for welding reach temperatures near 2000°C. The reaction involved is the combustion of acetylene, C_2H_2. The reaction mixture contains 175g of both acetylene and oxygen.

Write the balanced chemical equation.

Identify the limiting reagent and the excess reagent. Then determine how many grams of carbon dioxide are formed. And finally determine the number of grams of excess reagent remaining after the reaction.

If 48.2 liters of carbon dioxide (density of carbon dioxide = 1.79g/L) is actually collected, what is the percent yield?

Percent Yield Worksheet

1) Write the equation for the reaction of iron (III) phosphate with sodium sulfate to make iron (III) sulfate and sodium phosphate.

2) If I perform this reaction with 25 grams of iron (III) phosphate and an excess of sodium sulfate, how many grams of iron (III) sulfate can I make?

3) If 18.5 grams of iron (III) sulfate are actually made when I do this reaction, what is my percent yield?

4) Is the answer from problem #3 reasonable? Explain.

5) If I do this reaction with 15 grams of sodium sulfate and get a 65.0% yield, how many grams of sodium phosphate will I make?