

### Chemistry Unit 7 Worksheet 4

#### Samples of Every Kind of Problem

On a separate sheet of paper, write a complete solution to each of the problems below. Follow the procedure outlined in class. Be sure to circle your final answer.

- Calculate the number of moles of potassium chlorate,  $KClO_3(s)$ , that must decompose to produce potassium chloride,  $KCl(s)$ , and 0.8 moles of oxygen gas.
- In a single displacement reaction, magnesium metal reacts with hydrochloric acid to produce magnesium chloride and hydrogen gas. How many moles of hydrochloric acid are needed to completely react with 0.40 g of magnesium?
- Ethane,  $C_2H_6$ , reacts with oxygen gas to produce carbon dioxide gas and water vapor. What mass of oxygen gas is required to react with 0.20 moles of ethane?
- Determine the mass of sodium nitrate produced when 0.10 g of nickel (II) nitrate reacts with sodium hydroxide according to the following equation:  

$$Ni(NO_3)_2 + 2 NaOH \rightarrow Ni(OH)_2 + 2 NaNO_3$$
- In the copper-silver nitrate lab copper metal and silver nitrate solution reacted to produce silver metal and copper(II) nitrate in solution. A student placed a copper wire with a mass of 1.00 g in the reaction test tube. The silver nitrate solution contained 0.40 g of silver nitrate. He obtained 0.07 g of silver metal. Calculate the percent yield of silver.
- When hydrochloric acid (HCl) is added to sodium hydrogen carbonate, the products are water, sodium chloride and carbon dioxide gas. What is the percent yield of 0.88 g of  $CO_2$  gas collected when 50.0 g of sodium hydrogen carbonate reacts with excess HCl?
- Phosphorus and bromine react vigorously together to form phosphorus tribromide. If 0.0 g of phosphorus and 50. g of bromine react, how many grams of  $PBr_3$  could be produced?
- Iron sulfide and oxygen gas react to form iron oxide and sulfur dioxide. Determine the amount of  $SO_2$  that should be produced in a reaction between 66.0 g of  $FeS$  and 16.0 g of oxygen. What is the mass of the  $Fe$  reactant?

1. 1.1 moles  $K_2CO_3$     2. 0.200 moles HCl    3. 0.60 g  $H_2$     4. 0.40 g  $NaNO_3$

5. 80%    6. 0.007%    7. 10.0 g  $PBr_3$     8. 0.010 g  $SO_2$     9. 6.0 g  $Fe$  or