Stoichiometry

1. How many moles of Cu are needed to react with 5.8 moles of $AgNO_3$?

2. How many liters of carbon dioxide are produced from the complete combustion of 5.420 moles of ethanol ($C_2H_6O$)?

3. How many grams of water are produced when 2.500 moles of oxygen gas react with hydrogen gas?

4. How many grams of oxygen are required to produce 358.5 grams of ZnO? $2Zn + O_2 \rightarrow 2ZnO$

5. Hydrogen gas can be produced by reacting aluminum metal with sulfuric acid. How many grams of sulfuric acid are needed to react with 150.0 grams of aluminum?

6. At STP, how many liters of oxygen gas are required to react completely with 3.6 liters of hydrogen gas to form water?

7. What is the maximum number of grams of $PH_3$ that can be formed when 6.2 grams of phosphorus reacts with 4.0 grams of hydrogen gas?

8. How many grams of chlorine gas should be produced if 84.2 grams of aluminum chloride and 68.4 grams of bromine are combined?

9. 64.90 grams of potassium chloride are reacted with excess oxygen to produce potassium chlorate. If 77.1 grams are produced, what is the percent yield of this reaction?

10. The reaction of 100.0 grams of salicylic acid, $C_7H_6O_3$, with excess acetic anhydride produces 50.0 grams of aspirin, $C_9H_8O_4$, according to the following equation.
    $C_7H_6O_3 + C_4H_6O_3 \rightarrow C_9H_8O_4 + C_2H_4O_2$
    What is the percent yield for this reaction?

Name _____ Date _____ Class _____

# 9–3 Practice Problems

1. Identify the limiting reactant when 1.22 g of $O_2$ reacts with 1.05 g of $H_2$ to produce water.

2. Identify the limiting reactant when 4.68 g of Fe reacts with 2.88 g of S to produce FeS.

3. Identify the limiting reactant when 5.87 g of $Mg(OH)_2$ reacts with 12.84 g of HCl to form $MgCl_2$ and water.

4. Identify the limiting reactant when 6.25 g of $AgNO_3$ reacts with 4.12 g of NaCl to form $NaNO_3$ and AgCl.

5. Identify the limiting reactant when 7.81 g of HCl reacts with 5.24 g of NaOH to produce NaCl and $H_2O$.

6. Identify the limiting reactant when 6.33 g of $H_2SO_4$ reacts with 5.92 g of NaOH to produce $Na_2SO_4$ and water.

7. Identify the limiting reactant when 43.25 g of $CaC_2$ reacts with 33.71 g of water to produce $Ca(OH)_2$ and $C_2H_2$.

8. Identify the limiting reactant when 65.14 g of $CaCl_2$ reacts with 74.68 g of $Na_2CO_3$ to produce $CaCO_3$ and NaCl.

9. Identify the limiting reactant when 4.687g of $SF_4$ reacts with 6.281 g of $I_2O_5$ to produce $IF_5$ and $SO_2$.

10. If 4.1 g of Cr is heated with 9.3 g of $Cl_2$, what mass $CrCl_3$ will be produced?

11. What mass of $SO_2$ is produced from the reaction between 31.5 g of $S_8$ and 8.65 g of $O_2$?

12. What mass of $SO_3$ is produced from the reaction of 12.4 g of $SO_2$ and 3.45 g of $O_2$?

13. What mass of $H_2SO_4$ is produced from the reaction of 6.58 g of $SO_3$ and 1.64 g of $H_2O$?

14. What mass of CdS is produced if 8.47 g of cadmium reacts with 2.51 g of sulfur?