Honors Chemistry: Chemical Reactions / Stoichiometry Review Sheet

*(a) Write a **balanced** equation for each set of reactants below. (b) Identify the type of reaction for each. Remember to cross charges for ionic compounds and acids. Consult the activity series for "single replacement" and the solubility rules for "double replacement" reactions. (c) Write all double replacement reactions as Net Ionic Equations.*

1. Iron + sulfur →

2. Zinc + Copper (II) sulfate →

3. Aluminum + oxygen →

4. Copper (II) chloride + Ammonium hydroxide →

5. Aluminum + sulfuric acid →

6. mercury (II) oxide →

7. Iron + water →

8. Propane (C_3H_8) is burned

9. Hydrochloric acid + Calcium hydroxide →

10. Carbon burns by reacting with oxygen

Write balanced equations for each of the following – include all appropriate symbols.

11. Zinc metal reacts with a solution of Hydrochloric acid to produce dissolved Zinc chloride and hydrogen gas.

12. A solution of Potassium hydroxide is heated in a test tube. A white precipitate (Potassium oxide) and water are produced.

Show all work for the following calculations. Report answers in the correct number of significant figures. Remember, all problems begin with a balanced equation.

13. How many moles of Oxygen are needed to burn 425 g of Sulfur? $S + O_2 \rightarrow SO_2$

14. What mass of aluminum is necessary to produce 4.72 L of hydrogen at STP?
Aluminum + Nitric acid → Aluminum nitrate + Hydrogen gas

15. How many grams of S_8 are required to produce 3.9×10^{24} molecules of SO_2?
$S_8 + O_2 \rightarrow SO_2$

16. If 4.35 moles of oxygen are consumed by this reaction, how many moles of water vapor can be produced? $C_3H_8 + O_2 \rightarrow H_2O + CO_2$

17. Nitrogen monoxide is a component of smog and is produced by the following reaction:

$$N_2 + O_2 \rightarrow NO$$

55.0 L of nitrogen react with 39.0 L of oxygen.

a. What is the limiting reactant?

b. How many grams of NO can be produced?

c. Calculate the *percent yield* if 89.0 g of NO is formed experimentally.

18. When 15.3 g Ca react with 4.5 g of HCl according to the equation below:

$$Ca + HCl \rightarrow CaCl_2 + H_2$$

a. Which is the limiting reactant?

b. How many formula units of calcium chloride are produced?

c. How many liters of hydrogen gas are produced?

d. How many grams of the excess reactant remain?