CH 201Self Study Worksheet 1

1. A 532.78 g sample of $Al_xGa_yAs_z$ was found to contain 339.11 g of Ga and 156.16 g of As.
   a. Find the empirical formula for $Al_xGa_yAs_z$.

   b. If the molecular weight is 766.76, what is the molecular formula?

2. For $Mg(ClO_4)_2$,
   a. Find the mass % of Mg, Cl and O.

   b. How many grams of $Mg(ClO_4)_2$ would contain 7.38 g of chlorine?

   c. How many moles of magnesium are contained in 230.57 g of $Mg(ClO_4)_2$?

3. Balance the following chemical reaction with the smallest whole number coefficients.

$$\_\_ AlCl_3 + \_\_ H_2O + \_\_\_ O_2 \rightarrow \_\_\_ Al + \_\_\_ HClO_3$$

   a. How many grams of water are required to react with 3.57 g of $AlCl_3$?

   b. How many grams of Al will be formed?

4. For the following reaction,

$$Zr_2O_5 + 2\ H_2 \rightarrow Zr_2O_3 + 2\ H_2O$$

a. If you began with 216 g Zr_2O_5 and 107 g of H_2, which is the limiting reagent?

b. How many grams of the non-limiting reagent are left after the reaction is complete?

c. How many grams of Zr_2O_3 would be formed?

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5. a. For the following reaction, how many grams of carbon are needed to have a 20.0% excess with 3.765 g of water? Hint: %excess = (amount left over/amount used up) x 100

$$\_\_\_\ C\ (s) + \_\_\_\ H_2O\ (l) \rightarrow \_\_\_\ C_3H_4O_2\ (l)$$

b. What is the theoretical yield in grams for $C_3H_4O_2$ (l)?

c. What is the % yield if the actual yield is 5.31 g?

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6. a. Please fill in the following reaction table in moles for 45.21 g Cu_2O_3, 12.77 g N_2 and 24.05 g O_2. Remember to balance the reaction first!

	___ Cu_2O_3	+ ___ N_2	+ ___ O_2	→	___ $Cu(NO_3)_3$
Initial					
Δ					
Final					

b. How many grams of $Cu(NO_3)_3$ are formed?

c. What is the % excess of the two non-limiting reagents?