IN CLASS LIMITING REACTANT PROBLEMS

NOTE: Work in groups. None of the equations are balanced. You must show all calculations to receive credit on your <u>own</u> paper.

1. Ammonia (NH_3) reacts with oxygen as shown in the following equation:

   $$NH_3 + O_2 \rightarrow N_2 + H_2O$$

   How many grams of H_2O may be formed from a reaction mixture containing 35.0 grams of NH_3 and 50.0 g of O_2?

2. Magnesium nitride may be prepared by the direct reaction of the elements as shown by the equation:

   $$Mg(s) + N_2(g) \rightarrow Mg_3N_2(s)$$

   For each of the following combinations of reactants, decide which is the limiting reactant:
   a. 2.00 moles Mg, 0.500 mol N_2
   b. 3.00 g Mg, 0.100 mole N_2
   c. 3.00 g Mg, 3.00 g N_2

3. What is the limiting reactant when 2.00 g of Si and 2.00 g of C combine according to the following equation?

   $$Si + C \rightarrow SiC$$

4. A 4.00 g sample of Fe_3O_4 is reacted with 13.3 g O_2 to produce Fe_2O_3 according to the following equation:

   $$Fe_3O_4 + O_2 \rightarrow Fe_2O_3$$

   How many grams of Fe_2O_3 are produced.?

5. Sulfur dioxide (SO_2) can be produced form the reaction of hydrogen sulfide (H_2S) and oxygen as shown by the following equation:

   $$H_2S + O_2 \rightarrow SO_2 + H_2O$$

   a. How many grams of SO_2 can be produced form 70.0 g of H_2S? and 125 g of O_2?
   b. How many grams of excess reactant is left over after the reaction is complete?

6. A mixture of 80.0 g Cr_2O_3 and 8.00 g of C is used to produce elemental Cr by the reaction: $Cr_2O_3 + C \rightarrow Cr + CO$
   a. What is the theoretical yield of Cr that can be obtained from the reaction mixture?
   b. The actual yield in the lab is 21.7 g Cr. What is the percent yield for the reaction?