Limiting Reactant and Percent Yield Practice

Name_____

1) Consider the following reaction:

$$NH_4NO_3 + Na_3PO_4 \rightarrow (NH_4)_3PO_4 + NaNO_3$$

Which reactant is limiting, assuming we started with 30.0 grams of ammonium nitrate and 50.0 grams of sodium phosphate. What is the mass of <u>each</u> product that can be formed? What mass of the excess reactant(s) is left over?

2) Consider the following reaction:

$$CaCO_3 + FePO_4 \rightarrow Ca_3(PO_4)_2 + Fe_2(CO_3)_3$$

Which reactant is limiting, assuming we start with 100. grams of calcium carbonate and 45.0 grams of iron (III) phosphate. What is the mass of <u>each</u> product that can be formed? What mass of the excess reactant(s) is left over?

3) Write the balanced equation for the reaction given below:

$$CuCl_2 + NaNO_3 \rightarrow Cu(NO_3)_2 + NaCl$$

a) If 15 grams of copper (II) chloride react with 20. grams of sodium nitrate, how much sodium chloride can be formed?

b) What is the name of the limiting reagent? _____

c) How much of the excess reagent is left over in this reaction?

d) If 11.3 grams of sodium chloride are formed in the reaction, what is the percent yield of this reaction?

4) Write the equation for the reaction of iron (III) phosphate with sodium sulfate to make iron (III) sulfate and sodium phosphate.

a) If you perform this reaction with 25 grams of iron (III) phosphate and an excess of sodium sulfate, how many grams of iron (III) sulfate can you make?

b) If 18.5 grams of iron (III) sulfate are actually made when you do this reaction, what is your percent yield?

c) Is the answer from problem b) reasonable? Explain.

d) If you do this reaction with 15 grams of sodium sulfate and get a 65.0% yield, how many grams of sodium phosphate will you make?

5. Write the balanced equation for the reaction given below:

$$C_2H_6 + O_2 \rightarrow CO_2 + H_2O$$

a) If 16.4 L of C_2H_6 reacts with 0.980 mol of O_2 how many liters of carbon dioxide gas will be produced?

b) How many oxygen atoms will be in this sample of carbon dioxide?

c) How many moles of the excess reactant will be left over?

d) How many grams of the excess reactant will be left over?

e) How many of each atom that makes up the excess reactant will be left over?

6) Choose three problems from the Ebbing textbook from pp 119-120 on percent and theoretical yield, complete them and staple them to this page