Chemistry 101 practice problems. **NO Solution** will be posted or discussed in lecture. Why??? To ensure that students take responsibility for solving these problems.

1) Write down the <u>balanced</u> equation for the *combustion* of propanol, C_2H_5OH.

2) What is the percent composition of copper in copper(II) sulfate pentahydrate?

3) What is the empirical formula for the ionic compound with the following % composition: (see if you can also write down correctly its name)
%N = 35.0%   % H = 5.0%   %O = 60%

4) Consider the thermal decomposition of a metal oxalate: $XC_2O_4(s)$ which becomes the metal carbonate XCO_3 upon heating. If 64.0 mg of the metal oxalate is heated and only 50.0 mg of the metal carbonate remains, what is the metal, X?

5) 1) If 5.40 g of aluminum powder (Al, 27.0 g/mole) reacts with 5.00 g of oxygen gas (O_2, 32.0 g/mole), to form aluminum oxide (Al_2O_3) what are the masses of all the chemical species present after the reaction goes to completion? (Please write final answers in the spaces provided).

g Al = _____ ; g O_2 = _____ ; g Al_2O_3 = _____

6) Suppose that the synthetic production of ammonia gas from nitrogen gas and hydrogen gas has a 75% yield. How many grams of nitrogen gas would you need to add to an excess amount of hydrogen gas to obtain 920. kg of ammonia?

7) Dinitrogen oxide (N_2O) can be formed from a reaction of nitrogen gas (N_2) with oxygen gas (O_2). A tiny portion of the starting mixture is represented by the diagram at left, where the squares   represent N_2 molecules and the circles represent O_2 molecules. Draw the expected **product mixture** after the reaction is completed in the box at right. Plese represent **N2O** using a **triangle**,

Mixture of reactants
where N_2 = ☐ O_2 = ○ N_2o =   △

Mixture of **products**