**General Chemistry - Chapter 9**

**1.)** If 24.3g of mercury (II) nitrate and 22.5g of sodium iodide in the form of solutions react; what mass of the excess reactant will remain, and how much of the insoluble product will be formed?

**2.)** If you are trying to produce solid silver from silver (I) nitrate and aluminum metal, how much of each reactant would be necessary to produce one ounce of silver? (2.215 lbs = 1.00 kg and 16.0 oz = 1.00 lbs)

**3.)** If 0.250 moles of lead (II) nitrate and 0.750 moles of sodium iodide react, by how many moles is the excess in excess, and what is the theoretical yield (solve for mass)?

**4.)** The combustion of octane ($C_8H_{18}$) is often used as the mode of transportation for our society.

**a.)** if 10.0 moles of octane combusts, how many moles of oxygen are needed?

**b.)** If one mole of any gaseous substance takes up 22.414 L, what volume of oxygen is needed?

**c.)** What mass of water will be produced by the same 10.0 moles of octane?

**d.)** Knowing the density of water is 1.00 g/mL, what volume of water is produced?

**5.)** The typical lighter contains liquefied butane ($C_4H_{10}$), when released it turns to a gas and can combust.

**a.)** what is the balanced reaction for the combustion?

**b.)** How many moles of oxygen are needed to combust 0.20 g of butane gas?

**c.)** How many grams of carbon dioxide will be released?

**6.)** If tablet of Tums contains 550 mg of calcium carbonate, how many tablets would be necessary to neutralize 1.0 mole of hydrochloric acid (approximately what is in your stomach)?

**7.)** Please devise a reaction to produce solid copper. How much of each reactant would you need in order to produce 1.00 metric tons (1000.0 kg) of copper; if your yield for the reaction is 85%?

**8.)** In a future lab we will react zinc (II) metal with hydrochloric acid. What will be the limiting reactant if we use 0.15 g of zinc and 5.0 mL of 6.0 M hydrochloric acid? Using information given previously on this sheet, what volume of gas would be produced? Would the other product be seen?