**Gas Law Stoichiometry**

On a separate piece of paper solve the following, SHOW ALL WORK!!!

1. Given the following unbalanced chemical equation from the combination reaction of sodium metal and chlorine gas:

\_\_\_Na(s) + \_\_\_Cl2(g) → \_\_\_NaCl(s)

What volume of chlorine gas, measured at STP, is necessary for the complete reaction of 4.81 g of sodium metal.

1. \_\_\_C3H8(g) + \_\_\_O2(g) → \_\_\_CO2(g) + \_\_\_ H2O(g)
   1. Balance the reaction
   2. What volume of oxygen at 25oC and 1.04 atm is needed for the complete combustion of 5.53 g of propane?
2. Potassium permanganate is produced commercially by oxidizing aqueous potassium manganate \_\_\_K2MnO4(aq) + \_\_\_Cl2(g) → \_\_\_KMnO4(aq) + \_\_\_ KCl(aq)
   1. Balance equation
   2. What volume of chlorine, at STP, is needed to produce 10.0 g of KMnO4?
3. If water is added to magnesium nitride, ammonia gas is produced when the mixture is heated. \_\_\_Mg3N2(s) + \_\_\_ H2O→ \_\_\_MgO(s) + \_\_\_NH3(g)
   1. Balance equation
   2. If 10.3 g of magnesium nitride is treated with 10.3 g of water, what volume of ammonia gas would be collected at 24oC and 752 mm Hg?
4. How many grams of aluminum chloride must decompose in order to produce 3.1 L of chlorine gas at 50.0oC and 98.4 kPa? (start with writing the balanced equation for DECOMPOSITON reaction)
5. What volume of nitrogen can be produced by the decomposition of 50.0 g of NH4NO2 at 25oC and 1.20 atm? NH4NO2(s) → N2(g) + 2H2O(l)