**Gas Stoichiometry Practice**

*For all of these problems, assume the reactions are being performed at a pressure of 1.0 atm and a temperature of 298 K unless otherwise noted.*

1) Calcium carbonate decomposes at high temperatures to form carbon dioxide and calcium oxide:

**CaCO3(s) 🡪 CO2(g) + CaO(s)**

How many grams of calcium carbonate will I need to form 3.45 liters of carbon dioxide?

2) Ethylene burns in oxygen to form carbon dioxide and water vapor:

**C2H4(g) + 3 O2(g) 🡪 2 CO2(g) + 2 H2O(g)**

How many liters of water can be formed if 1.25 liters of ethene are consumed in this reaction?

3) When chlorine gas is added to C2H2, 1,1,2,2-tetrachloroethane (C2H2Cl4­) is formed:

**2 Cl2(g) + C2H2(g) 🡪 C2H2Cl4(l)**

What volume of Cl­2 will be needed to make 75.0 grams of C2H2Cl4 at 297K and 3.5atm? \*\*Hint, you will need to use stoichiometry and Ideal gas law to solve!\*\*

4) The reaction below is the reaction between gasoline (octane) and oxygen that occurs inside automobile engines.

**2 C8H18(l) + 25 O2(g) 🡪 16 CO2(g)  + 18 H2O(g)**

How many grams of water would be produced if 20.0 liters of O­2 gas were burned at a temperature of -10.0°C and a pressure of 1.3 atm?

\*\*Hint, you will need to use stoichiometry and Ideal gas law to solve!\*\*

2C8H18*(l)* + 25O2*(g)* 🡪 16CO2*(g)* + 18H2O*(g)*

The above reaction is the reaction between gasoline (octane) and oxygen that occurs inside automobile engines.

1. If 4.00 moles of gasoline are burned, what volume of oxygen is needed if the pressure is 0.953 atm, and the temperature is 35.0°C?

\*\*Hint, you will need to use stoichiometry and Ideal gas law to solve!\*\*

2) How many grams of water would be produced if 20.0 liters of oxygen were burned at a temperature of -10.0°C and a pressure of 1.3 atm?

\*\*Hint, you will need to use stoichiometry and Ideal gas law to solve!\*\*

1. If you burned 1 gallon of gas C8H18 (approximately 4000grams), how many liters of carbon dioxide would be produced at a temperature of 21.0°C and a pressure of 1.00 atm.

\*\*Hint, you will need to use stoichiometry and Ideal gas law to solve!\*\*