Unit 8 Stoichiometry
Intro to Stoichiometry and Density

Name _____
Block _____

Density = Mass/ Volume	**1 Mole = 22.4 Liters of Gas**

1. Calculate the density of carbon dioxide at STP.

$$\textbf{\textit{Density}} = \frac{\textbf{\textit{mass}}}{\textbf{\textit{volume}}} = \frac{\textbf{\textit{molar mass}}}{\textbf{\textit{molar volume}}} = \text{\_\_\_\_\_} =$$

2. Calculate the density of helium gas at STP.

3. Calculate the density of ammonia at STP.

The following problems are NOT at STP:

4. If the density of oxygen gas is 1.29 g/L, how many grams of magnesium will react with 100 ml of oxygen gas at STP?

$$\mathbf{2\ Mg_{(s)} + 1\ O_{2\,(g)} \rightarrow 2\ MgO_{(s)}}$$

5. In 1905, Fritz Haber discovered a method for producing ammonia from the nitrogen in air use the reaction below:

$$\mathbf{1\ N_{2\,(g)} + 3\ H_{2\,(g)} \rightarrow 2\ NH_{3\,(g)}}$$

The process involves heating the reactants to 450 °C and increasing the pressure to 200 atmospheres in the presence of an iron catalyst. The density of the hydrogen gas under these conditions is 6.724 g/L, and the density of ammonia gas is 57.15 g/L. How many liters of ammonia gas will be produced, if 500.0 L of hydrogen gas react with excess nitrogen gas?