

Name _____ Date _____ Period _____

Gas Ws #6: More Fun with Gas Stoichiometry

- Methane, the principal constituent of natural gas, has the formula CH_4 . When it is burned in air, the combustion products are carbon dioxide and water. Assume STP.
 - Write an equation for the combustion of methane.
 - How many moles of water could be formed using 1.00 mol of methane?
 - How many moles of water would be produced when 4.00 grams of methane are burned?
- Beautiful metallic silver can be reclaimed from silver chloride by the following reaction:
$$\text{AgCl (s)} + \text{H}_2 \text{(g)} \rightarrow \text{Ag (s)} + \text{HCl (aq)}$$
 - Balance the equation.
 - What volume of hydrogen gas, measured at 25°C and 1.00 atm, would be used in changing 28.7 g of AgCl back to metallic silver?
- The acetylene (C_2H_2) in acetylene lanterns is generated by the reaction of water and calcium carbide (CaC_2) as follows:
$$\text{CaC}_2 \text{(s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{(l)} + \text{C}_2\text{H}_2 \text{(g)}$$
 - Balance the equation.
 - Calculate the volume of C_2H_2 (measured at 25°C and 1.00 atm) released if 0.450 mole of CaC_2 is used in the reaction.
- Oxygen is often generated in the laboratory by the reaction between sodium peroxide (Na_2O_2) and water, under appropriate conditions. Sodium hydroxide is the other product.
 - Write the balanced equation.
 - How many grams of Na_2O_2 must be used to generate 1.0 L of oxygen at 25.0°C and 1.00 atm? (Assume all the sodium peroxide reacts).
- Given the following unbalanced equation: $\text{Cu}_2\text{O (s)} + \text{H}_2 \text{(g)} \rightarrow \text{Cu (s)} + \text{H}_2\text{O (g)}$
 - Balance the equation.
 - Calculate the volume of hydrogen, measured at STP, needed to react with 8.30 moles of Cu_2O .
- Zinc will dissolve in a solution of sulfuric acid and produce Hydrogen gas and a solution of Zinc II Sulfate?
 - Write a balanced equation for the reaction.
 - How many grams of zinc must be dissolved in sulfuric acid in order to obtain 500.0 mL of hydrogen at 20.0°C and 770.0 mm Hg?