

## Chapter 13.1 &amp; 14 Review Packet: Gases

**Chapter 13.1**

Be able to answer:

1. What are the assumptions of the Kinetic-Molecular Theory?
2. Why can gases be compressed?
3. What are diffusion & effusion? How does the rate of effusion of a gas depend on its molar mass?
4. Why do gases exert pressure?
5. Use the following equation and pressure equalities in Chart B to solve pressure problems:

$$\text{Dalton's Law of Partial Pressures: } P_{\text{Total}} = P_1 + P_2 + P_3 + \dots$$

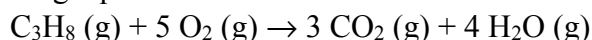
**Chapter 13.1 Problems** (answer on separate sheet): pg. 415 #65, 66, 69, 70**Chapter 14**

Be able to answer:

1. What are the four properties of a gas that can be used to describe it?
2. What kind of relationship (direct or inverse) is there between the pressure and volume of a gas?
3. What kind of relationship (direct or inverse) is there between the volume and temperature of a gas?
4. What units must the temperature of a gas always be in to use the gas laws? Why?
5. What kind of relationship (direct or inverse) is there between the pressure and temperature of a gas?
6. Use the gas laws (equations will be given) to solve problems involving changes in P, V, or T.
7. What is meant by "Standard Temperature and Pressure" (STP)?
8. To use the Ideal Gas Law, what must the units of temperature and of volume be?
9. Which measurement's units must you look at to determine the appropriate value of R to use?
10. Use the Ideal Gas Law to solve questions involving pressure, temperature, volume, and moles of a gas
11. Use the Ideal Gas Law or  $PM = DRT$  to determine the molar mass of an unknown gas.
12. Under what conditions of temperature and pressure does the behavior of a gas become non-ideal? Why? (i.e. what 2 assumptions are no longer true?)
13. Make volume-volume or mass-volume calculations.

**Chapter 14 Problems** pp. 448-449 #88(a-d), 92, 94, 95(a), 96, 97 (answer moles instead of molecules), 100, 102 (write & balance reaction!), 104**Additional Problems**

- a. What volume will 0.00660 mol of hydrogen gas occupy at 0.907 atm and 25.0 K?
- b. What is the pressure, in kPa, of 3.95 mol of  $\text{Cl}_2$  compressed to 850. mL at 15.0°C?
- c. What is the temperature, in °C, of 0.120 mol of an ideal gas in a 250. mL container at 500.0 kPa?
- d. What is the molar mass of a gas if a 27.9 g sample in a 6.57 L container has a pressure of 1.76 atm at 54°C?
  - Bonus question: Which of the following gases could it be:  $\text{N}_2\text{O}$ ,  $\text{NO}_2$ ,  $\text{CO}$ ,  $\text{PCl}_3$ , or  $\text{SO}_2$ ?
- e. What volume of  $\text{CO}_2$ , at STP, can be produced by the combustion of 82.3 L of propane gas,  $\text{C}_3\text{H}_8$ , also at STP, according to the following equation?



- f. What mass of  $\text{KClO}_3$  must be used in order to generate 5.00 L of  $\text{O}_2$  at STP according to the following equation?



- g. What volume of  $\text{O}_2$  gas will be collected at 95.6 kPa and 225°C by the decomposition of 15.3 g of barium peroxide,  $\text{BaO}_2$ ?

