

## **CH 222 Chapter Nine Study Guide**

- Be able to describe how pressure measurements are made.
- Be comfortable with the units of pressure, especially atm, mm Hg, torr, barr and Pa.
- Know what STP refers to and know its significance.
- Understand the Ideal Gas Law ( $PV = nRT$ ); know when it applies and when it does not.
- Realize the importance of pressure, volume, temperature, number of moles, density, etc., especially when they are related to each other. Example: if pressure increases, temperature increases and volume decreases, etc.
- Know how to use the ideal gas law to solve problems similar to those in the problem set for this chapter.
- Be able to calculate the molecular weight (or molar mass) or the density of a gas knowing pressure, temperature, etc.
- MEMORIZE the value for the gas law constant,  $R = 0.082057 \text{ L atm mol}^{-1} \text{ K}^{-1}$ . (Note that we will be using a different value for R in the near future - same R but expressed in different units.)
- Be able to use Dalton's Law of Partial Pressures to solve for individual contributions to the pressure of the system. Understand the importance of mole fractions when solving for Dalton's Law contributions.
- Be able to explain the Kinetic Molecular Theory (KMT) and its major assumptions. Know when these assumptions can be limiting.
- Understand the phenomena of diffusion and effusion. Be able to solve Graham's Law to find the relative rates of the gases.
- Realize that gases do not often obey the ideal gas laws due to "realistic" volume and intermolecular forces; instead, they must be described using the van der Waals equation. Know the effect of going from "ideal" gases to "real" gases using the van der Waals equation.
- Be able to solve and understand the assigned problems in problem set #4.