• **Ch. 5 Review Practice**
  o Textbook Review WKS
  o Multiple Choice Review
  o Optional: In Study Guide: p. 96 # 4, 14, 15, 17, 19, 29, 30, 31 and p. 105 # 4, 13

**Pressure of Gases**
- Define and explain pressure as a force applied to an area \( P = \frac{\text{Force}}{\text{Area}} \)
- Explain the physical basis for gas pressure (*due to collisions of molecules*)
- Explain why there is atmospheric pressure
- Convert between different units of pressure (Pa, atm and mm Hg)
- Explain how to measure gas pressure (atmospheric and in the laboratory) and describe the equipment used (barometer and manometer) and how it works

**The Gas Laws (Boyle’s Law, Charles’s Law, Avogadro’s Law)**
- Explain the relationship between any two gas properties: pressure, volume, temperature, and moles
- Use the gas laws to determine changes in one property given a change in one or more of the other properties
- Understand the concept that absolute zero is the temperature at which no molecular motion exists.
- Understand that one must use units of Kelvin for temperature when employing the gas laws.

**The Ideal Gas Law and Gas Stoichiometry**
- Explain the assumptions and properties of an ideal gas (*negligible molecular volume, elastic collisions, no attractions or repulsions between molecules*)
- Use the ideal gas law \( (PV = nRT) \) to determine \( P, V, n, \) or \( T \) when given or able to determine the other 3
- Make calculations using the molar mass-density form of the ideal gas equation \( (P \cdot M = DRT) \) or be able to calculate molar masses or densities of gases using \( PV = nRT \) and \( M = \text{mass}/n \).
- Perform stoichiometric calculations for reactions involving gas volumes using the Ideal Gas Law.
- You may convert using 22.4 L/mole if you have a gas at STP (STP conditions are 1 atm and 0°C)

**Dalton’s Law of Partial Pressures**
- State Dalton’s Law of Partial Pressures and use it to find the total pressure or partial pressure of a gas \( (P_A + P_B + P_C + \ldots = P_{\text{Total}}) \)
- Calculate the mole fraction of a gas in a mixture and use the mole fraction to determine the partial pressure of a gas in a gas mixture \( (\text{mole fraction } A = X_A = n_A / n_{\text{total}} \text{ and } P_A = X_A \cdot P_{\text{Total}}) \)
- Explain how to perform a reaction in which a gas is collected over H₂O and determine the properties of the collected gas using the ideal gas equation.
- Realize that one can use the ideal gas law to convert between partial pressure of a gas in a mixture and its moles.
  \( (P_A \cdot V = n_A \cdot RT) \)
The Kinetic Molecular Theory of Gases

- State and explain the 4 assumptions of KMT and explain the behavior of an ideal gas in relationship to these assumptions
- Define kinetic energy in terms of the velocity of a particle \( KE = \frac{1}{2} m v^2 \)
- Interpret graphs of the Maxwell distributions of molecular speeds and explain why the distributions vary according to molar mass of the gas and temperature as they do.
- Explain the dependence of root mean squared velocity of a gas on the temperature and its molar mass
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  u_{rms} = \sqrt{\frac{3RT}{M}} \quad \text{(qualitative only)}
  \]
- Define diffusion and effusion and explain relative rates in terms of relative molecular masses

Deviation from Ideal Behavior

- Explain why gases deviate from ideal behavior in terms of the two assumptions of KMT that are invalid
- Explain the conditions under which a gas behaves most ideally and under which it significantly deviates from ideal behavior.