Gases and Their Properties

STUDY LIST From Paul Groves

Measuring Pressure

- ☐ Know the pressure of the atmosphere at sea level measured in atm, kPa, mmHg, torr, psi
- ☐ Convert one pressure unit into another
- ☐ Understand how to measure pressure using a U-tube manometer, open-end manometer, and a barometer

Recognizing Graphs

- ☐ Recognize from a graph whether two variables are directly or inversely proportional.
- ☐ Manipulate a curve graph to give a straight-line graph
- ☐ Form a mathematical law from a straight-line graph

Boyle's Law

- ☐ Sketch a P vs. V graph
- ☐ Manipulate P V data so a straight-line graph is obtained
- ☐ State Boyle's Law
- ☐ Recognize situations of Boyle's Law
- ☐ Do Boyle's Law problems

Charles' Law

- ☐ Sketch a V vs. T graph
- ☐ Graphically determine a value for absolute zero
- ☐ State Charles's Law
- ☐ Explain why temperatures must be in K
- ☐ Recognize situations of Charles's Law
- ☐ Do Charles's Law problems

Combined Gas Law

- ☐ Know the Combined Gas Law (P,V&T)
- ☐ Show how each of the gas laws is a special case of the Combined Gas Law
- ☐ Know Avogadro's Law (V&n)

Ideal Gas Law

- ☐ Know the Ideal Gas Law
- ☐ Given the molar volume of a gas (22.414 L at STP) determine values of R, the ideal gas constant, with different pressure units
- ☐ Do Ideal Gas Law problems

Twists on the Ideal Gas Law

- ☐ Derive the gas density equation from the Ideal Gas Law
- ☐ Do gas density problems
- ☐ Calculate molar mass from P, V, and T data

Stoichiometry

- ☐ Do Gas Laws and Stoichiometry problems by determining mass or moles of a substance

Dealing with Mixtures of Gases

- ☐ Know Dalton's Law of Partial Pressures
- ☐ Do Partial Pressure problems
- ☐ Apply this to gases collected over water

Explaining the Gas Laws

- ☐ Know the principal features of the Kinetic Molecular Theory of gases
- ☐ Be able to explain why each of the gas laws works in terms of the Kinetic Molecular Theory

Why Do All Gases Act The Same?

- ☐ Understand the significance of the Maxwell-Boltzmann distribution curves on pages 566-567
- ☐ Derive Graham's Law of Effusion from rms or KE of two gases
- ☐ Do Graham's Law problems

Real Gases vs. Ideal Gases

- ☐ Compare van der Waal's equations for Real gases with the Ideal Gas Law
- ☐ Know the correction factors that appear in the Real Gas Law