

12 • Gases and Their Properties

STUDY LIST

- 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
- Convert gauge pressure into total pressure

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

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

- Know the General Gas Law (P,V&T)
- Know Avogadro's Law (V&n)
- 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
- Do Ideal Gas Law problems

- Derive the gas density equation from the Ideal Gas Law
- Do gas density problems

- Calculate molar mass from P, V, and T data

- Do Gas Laws and Stoichiometry problems

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

- 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
- 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

- 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