UNIT 4 GASES AND THEIR BEHAVIOR

Textbook References: *Chemistry* Zumdahl 5th Edition Chapter 5

1. state kinetic molecular theory
2. state Bolye's Law, Charles Law Avogadro's Hypothesis, Dalton's Law of Partial Pressure, and Graham's Law
3. solve problems using combine gas law and ideal gas law
4. solve problems using Dalton's Law of Partial Pressure
5. solve problems using the relationship between partial pressure and mole fraction
6. solve problems using gas laws and stoichiometry at and not at STP
7. solve problems using Graham's Law
8. determine the rms velocity of a gas
9. describe the relationship between kinetic energy and temperature
10. distinguish between ideal and real gases
11. describe the conditions that result in a gas deviating from ideal gas laws
12. determine which gases will deviate the most from ideal gas law
13. write van der Waal's equation and solve problems using the equation
14. analyze the relative values of the constants a and b for two gases

Vocabulary

STP	ideal gas	temperature
mole fraction	real gas	Kelvin
partial pressure	rms velocity	
average kinetic energy	pressure	

AP Course Guide correlation:

II. States of Matter (20%)
A. Gases
1. Laws of ideal gases
a. Equation of state for an ideal gas
b. Partial pressures
2. Kinetic molecular theory
a. Interpretation of ideal gas laws on the basis of this theory
b. Avogadro's hypothesis and the mole concept
c. Dependence of kinetic energy of molecules on temperature
d. Deviations from ideal gas laws

IB Course Outline correlation

1.4.4 Apply Avogadro's law to calculate reacting volumes of gases.
1.4.5 Apply the concept of molar volume at standard temperature and pressure in calculations.
2 The molar volume of an ideal gas under standard conditions is 2.24×10^{-2} m^3 mol^{-1} (22.4 dm^3 mol^{-1}).
1.4.6 Solve problems involving the relationship between temperature, pressure and volume for a fixed mass of an ideal gas.
1.4.7 Solve problems using the ideal gas equation, $PV = nRT$
1.4.8 Analyse graphs relating to the ideal gas equation.