Chemistry 2nd Semester Exam Review

Chapter 8: Chemical Equations and Reactions

* Indications of a reaction
* Word and formula equations
* Balancing equations
* Types of reactions – writing products
* Activity series

Chapter 9: Introduction to Stoichiometry

* Types of Stoichiometry
* Mole ratio
* Molar mass
* Dimensional analysis conversions
* Limiting reactant
* Percentage yield

Chapter 10: The Kinetic-Molecular Theory of Matter

* Kinetic-molecular theory
* Ideal gases
* Properties of gases
* Liquids and their properties
* Solids and their properties
* Changes of state – molar enthalpy of fusion and vaporization
* Phase diagrams
* Water and its properties

Chapter 11: Gases

* Pressure and units - STP
* Partial Pressures
* Gas Laws – Boyle’s law, Charles’s law, Gay-Lussac’s law, Combined gas law
* Gas volumes – Avogadro’s law
* Ideal gas law
* Diffusion vs. effusion

Chapter 12: Types of Mixtures

* Solutions – properties and examples
* Suspensions – properties and examples
* Colloids – properties and examples, Tyndall effect
* Electrolytes vs. nonelectrolytes
* Rates of dissolution, solid in liquid, gas in liquid
* Solubility – saturated vs. unsaturated, supersaturated
* Enthalpy of solution
* Solution concentrations – molarity, molality

Chapter 13: Ions in Aqueous Solutions and Colligative Properties

* Dissociation
* Precipitation reactions – net ionic equation, spectator ions
* Ionization
* Colligative properties – vapor pressure, freezing point, boiling point, osmosis
* Osmosis – osmotic pressure

Chapter 14: Acids and Bases

* Properties and examples of acids and bases
* Nomenclature
* Common industrial uses of acids
* Types of acids and bases – Arrhenius, Bronsted-Lowry, Lewis
* Strengths of acids and bases
* Acid base reactions – acid with metal, complete ionization, neutralization
* Conjugate acid-base pairs – direction reaction is favored
* Amphoteric compounds
* Acid rain

Chapter 15: Acid-Base Titration and pH

* Self-ionization in water
* Acidic, basic, neutral solutions
* pH and pOH
* [H₃O⁺] and [OH⁻]
* Acid-base indicators
* pH paper vs. pH meter
* Transition interval
* End point
* Titrations – standard solution, finding unknown concentration