

KIM101E: GENERAL CHEMISTRY COURSE

CHAPTER and TOPIC	CONTENTS
<p>Chp:1-2-8 Electronic Structure of Atom</p>	<p>Atoms and the Atomic Theory, Structure of Atoms, Dalton's Atom Model, Electromagnetic Radiation , Atomic Spectra, Hydrogen Atom (The Bohr Atom), Quantum Theory, Quantum Numbers, Energy Levels and Electron Orbitals, Electron, Pauli Principle, Electron Configurations.</p>
<p>Chp:9 ve 3 Periodic Table Chemical Compounds</p>	<p>Periodic Table, Classifying the Elements, Oxidation states of elements, Sizes of Atoms and Ions, Elektronegativity, Electron Affinity. Types of Chemical Compounds, Formulas of Chemical Compounds, The Mole Concept and Chemical Compounds, Composition of Chemical Compounds, Oxidation States: A Useful Tool in Describing Chemical Compounds.</p>
<p>Chp: 4 ve 5 Chemical Reactions Reactions in Aqueous Solutions</p>	<p>Balancing Chemical Equations, Chemical Equations and Stoichiometry, Chemical Reactions in Solutions, Molarity, Dilution of Solutions, Determining the Limiting Reactant in Chemical reactions, Other Practical Matters in Reaction Stoichiometry. The Nature of Aqueous Solutions, Precipitation Reactions and Net Ionic Equations, Acid-Base Reactions, Writing neutralization reactions, Oxidation-Reduction Reactions, Stoichiometry of Reactions in Aqueous Solutions: Titrations.</p>
<p>Chp:6 Gases</p>	<p>Introduction, Gas Pressure, The Simple Gas Laws, The Ideal Gas Equation and the General Gas Equation, Applications of the Ideal Gas Law, Gases in Chemical Reactions, Gases in Chemical Reactions, Mixtures of Gases and Partial Pressures, Kinetic-Molecular Theory of Gases, Gas Properties Relating to the Kinetic-Molecular Theory , Nonideal (Real) Gases</p>
<p>Chp:7 Termochemistry</p>	<p>Some Terminology in Thermochemistry, Heat , Heats of Reaction and Calorimetry, Work , First Law of Thermodynamics, Heats of Reaction, ΔU and ΔH, Hess's Law, Standard Enthalphy of Formation, Fuels as Sources of Energy.</p>

<p>Chp:10 Chemical Bonding -I</p>	<p>Classification of Bonds, Ionic Bonding, Covalent Bonding, Coordinate Covalent Bonds, Multiple Covalent Bonds, Polar Covalent Bonds-Electronegativity, Writing Lewis Structures, Formal Charge, Resonance, Exceptions to the Octet Rule</p>
<p>Chp:11 Chemical Bonding -II</p>	<p>The Shapes of Molecules-VSEPR, Hybridization of Atomic Orbitals, Bond Energies, Valence Bond Theory , Multiple Covalent Bonds and Valence Bond Theory, Molecular Orbital Theory, Bonding in Metals, Metallic Bonding</p>
<p>Chp:12 Liquids, Solids, and Intermolecular Forces</p>	<p>Liquids, Intermolecular Forces and Some Properties of Liquids, Vaporization of Liquids: Vapor Pressure, Clausius – Clapeyron Equation, Critical Point, Some Properties of Solids, Phase Diagrams (H₂O, CO₂, I₂), Van der Waals Forces, Hydrogen Bonding , Crystal Structures, X-Ray Diffraction, Chemical Bonds as Intermolecular Forces, Energy Changes Involving Ionic Crystal Formation.</p>
<p>Chp:13 Solutions and Their Physical Properties</p>	<p>Types of Solutions: Some Terminology, Solution Concentration, Mass%, Volume%, Mass/Volume%, ; ppm, ppb, Mole Fraction, Mole %, Molality, Intermolecular Forces, Solution Process and Enthalpy, Effect of Pressure and Temperature on Solubility, Solubilities of Gases (Temperature, Pressure Effect, Henry's Law, Vapor Pressures of Solutions (Ideal Solutions and Non-Ideal Solutions), Osmotic Pressure, Freezing-Point Depression and Boiling-Point Elevation of Nonelectrolyte Solutions, Solutions of Electrolytes.</p>
<p>Chp:15 Chemical Equilibrium</p>	<p>Dynamic Equilibrium, Equilibrium Constant, The Equilibrium Constant Expression, Relationships Involving Equilibrium Constants, Significance of the magnitude of an equilibrium constant, Le Chatelier Principle, Altering Equilibrium Conditions.</p>
<p>Chp:16 Acids and Bases</p>	<p>Arrhenius Theory, Brønsted-Lowry Theory of Acids and Bases, The Self-Ionization of Water and pH Scale, Strong Acids and Strong Bases, Weak Acids and Bases, Examples on Weak Acids and Bases, Polyprotic Acids, Ions as Acids and Bases, Equilibrium Calculations.</p>
<p>Chp:20 Thermodynamics</p>	<p>Spontaneity, Spontaneity and Chaos;The Concept of Entropy, Criteria for Spontaneous Change; Second Law of Thermodynamics, Free Energy and Free Energy Change, Standard Free Energy Change (ΔG°) , Free Energy Change and Equilibrium, Relationship Between ΔG° ve Equilibrium Constant (K)</p>