

Chemistry Unit 6 Outline: Thermochemistry, States of Matter and Intermolecular Forces

Chapter 10: Causes of Change

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Energy, Thermodynamics. Radiant Energy, Thermal Energy, Chemical Potential Energy, Potential Energy, Heat (q), Work (w), Internal Energy (E), $\Delta E = q + w$, $w = -P\Delta V$ (only conceptual understanding – no calculations), Enthalpy (Heat without Work), Physical Change (Kinetic vs. Potential), Heat Units (Joules and Calories), Specific Heat (c_p), Molar Heat Capacity (C), Physical Kinetic Change ($q = mc_p\Delta T$ and $q = nC\Delta T$), Relationship between c_p and C	10.1: Energy Transfer (pg. 338 to 344)		pg. 342 #1 to 4 (Practice); pg. 344 #1 to 19	
2	Systems versus Surroundings, Open System, Closed System, Isolated System, Reaction Pathway, Change in Enthalpy ($\Delta H = q$), Energy Diagram, Endothermic and Exothermic Change in Enthalpy ($\Delta H < 0$ Exothermic, $\Delta H > 0$ Endothermic), Molar Enthalpy for Kinetic Change ($\Delta H = C\Delta T$)	10.2: Using Enthalpy (pg. 345 to 349)		pg. 346 #1 to 3 Practice; pg. 347 #1 to 3 (Practice); pg. 349 #1 to 10	
3 to 5	Standard State, Standard Molar Enthalpy of Formation (ΔH_f°), $\Delta H = n\Delta H_f^\circ$, Standard Molar Enthalpy of Reaction and Combustion (ΔH_{rxn} and ΔH_{comb}), $\Delta H = n\Delta H_{rxn}$ and $\Delta H = n\Delta H_{comb}$, Hess's Law (Adding ΔH), Theoretical Molar Enthalpy of Reaction ($\Delta H_{rxn} = \sum H_{products} - \sum H_{reactants}$) – Direct Method to Calculate ΔH_{rxn} Law of Conservation of Energy (First Law of Thermodynamics), Physical and Chemical Calorimetry (Heat Gained = Heat Lost) using Constant-Volume Calorimeter (Bomb Calorimeter) or Constant-Pressure Calorimeter (Styrofoam Calorimeter), Calculating Experimental ΔH_{rxn}	10.3: Changes in Enthalpy During Chemical Reactions (pg. 350 to 357)		pg. 356 #1 & 2 (Practice); pg. 357 #1 & 2 (Practice) pg. 357 #1 to 7 Worksheet: ΔH , Hess's Law and Calorimetry (pg. 110 of the Unit 6 Notes)	
6	Lab #6: Calorimetry and Heat of Combustion (April 1, Friday)			Lab Report #6 Due: (F Block: April 11, Monday) (A & G Blocks: Apr 12, Tues)	
7	Chapter 10 Quiz (A Block: April 7, Thursday) (F & G Block: April 8, Friday)			Chapter 10 Review: pg. 370-372 #22 to 29, 36, 38, 40 and 43	

Chapter 11: States of Matter and Intermolecular Forces

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	States of Matter, Molecular Views and Kinetic Molecular Theory of Solids, Liquids and Gases, Surface Tension, Phase Changes (Evaporation, Condensation, Freezing, Melting, Sublimation and Deposition), Boiling Point and Melting Point, Heating Curve, Intermolecular Forces, van der Waals Forces (Dipole-Dipole Forces, London Dispersion Forces), Ion-Dipole Forces, Hydrogen Bonding, Properties of Covalent Crystalline Solids and Molecular Crystalline Solids	11.1: States and State Changes (pg. 378 to 384) 11.2: Intermolecular Forces (pg. 385 to 392)		pg. 384 #1 to 8, 11 to 13, 15 pg. 392 #1 to 8, 10 and 11	
2	Equilibrium, Vapour Pressure, Vapour Pressure versus Temperature, Gas-Liquid Equilibrium, Liquid-Solid Equilibrium, Solid-Vapour Equilibrium and Sublimation, Phase Diagrams, Critical Point, Triple Point	11.4: Phase Equilibrium (pg. 399 to 405)		pg. 404 (Practice) #1; pg. 405 #1 to 10	
3	Unit 6 Test (April 29, Friday)			Chapter 11 Review: pg. 408-411 #9 to 20, 31 to 36, 45 to 47, 53, 60 to 65 (all odds)	