

Honour Chemistry

Unit 6 Outline: Thermochemistry and Nuclear Chemistry

Chapters 11: Thermochemistry – Heat and Chemical Change

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Thermochemistry, Energy, Chemical Potential Energy, System, Surroundings, Universe, Law of Conservation of Energy, Endothermic and Exothermic Process, Heat and Physical Change, Kinetic (Temperature) Change, Joules and Calories, Specific Heat Capacity, $q = mC\Delta T$, Enthalpy (H), Heating Curve, Potential (Phase) Change, Molar Heat of Fusion (ΔH_{fus}), Molar Heat of Vaporization (ΔH_{vap}), $\Delta H = n\Delta H_{\text{fus}}$, $\Delta H = n\Delta H_{\text{vap}}$, ΔH notation, Molar Heat of Solution (ΔH_{sol}), $\Delta H = n\Delta H_{\text{sol}}$, Thermochemical Equations	11.1: The Flow of Energy (pg. 293 to 299) 11.3: Heat in Changes of State (pg. 307 to 313)		pg. 299 #1 to 10 pg. 311 #22 and 23; pg. 313 #24 to 29	
2	Calorimetry, Calorimeter, Heat of Reaction, $\Delta H = n\Delta H_{\text{rxn}}$, Potential Diagrams, Calorimetry Designs and Calculations (Heat Gain = Heat Lost), Molar Heat of Combustion (ΔH_{comb}), Molar Heat of Formation (ΔH_{f}), $\Delta H = n\Delta H_{\text{f}}$, $\Delta H = \Sigma H_{\text{products}} - \Sigma H_{\text{reactants}}$, Hess's Law of Heat Summation (Adding Thermochemical Equation)	11.2: Measuring and Expressing Heat Changes (pg. 300 to 306) 11.4: Calculating Heat Changes (pg. 314 to 318)		pg. 302 #11 and 12; pg. 304 #13 and 14; pg. 306 #15 to 19 pg. 317 #30 and 31; pg. 318 #32 to 35	
3	Greenhouse Effect, Other Forms of Energy Production	11.5: Energy Productions and Environments (Notes)		Chapter 11 Review pg. 322–324 #36 to 48, 50 to 63, 69 to 75	
4	Lab #6: Physical Calorimetry – Heat of Fusion and Heat of Solvation March 5, Wednesday			Lab #6 Report Due: (along with Lab #7) March 20, Thursday	
5	Chapters 11 Quiz March 6, Thursday				

Chapter 28: Nuclear Chemistry

Classes	Topics	Suggested Reading	✓	Assignments	✓
1	Radioisotopes, Radioactivity, Radiation, Radioactive Decay, Alpha (α), Beta (β) and Gamma (γ) Radiations, Half-Life ($t_{1/2}$) and Radioactive Decay Calculations, Transmutation Reactions, Transuranium Elements, Balancing Nuclear Reactions	28.1: Nuclear Radiation (pg. 841 to 844) 28.2: Nuclear Transformation (pg. 847 to 851)		pg. 844 #1 to 3 pg. 851 #6, 8 and 10 and Worksheet: Isotopic Dating and Half-Life	
2	Nuclear Fission, Nuclear Fission Reactor, Control Rods, Chain Reaction (Subcritical, Critical and Supercritical Reactions), Nuclear Fusion, Energy involved in Nuclear Reactions, Environmental Impact of Nuclear Energy Production	28.3: Fission and Fusion of Atomic Nuclei (pg. 853 to 856)		pg. 856 #11 to 15 Chapter 28 Review pg. 864–865 #22 to 29, 34 to 36, 39, 41, 45 to 47 Unit 6 Review: pg. 325 #1 to 16; pg. 867 #1 to 6, 10 to 13	
3	Lab #7: Chemical Calorimetry March 14, Friday			Lab #7 Report Due: March 20, Thursday	
4	Unit 6 Test (March 20, Thursday)			Unit 6 Practice Test	