

Tentative Reading Schedule for Chemistry 112 F 2009

	Date	Topics	Vocabulary--learn definitions before class date listed. For terms separated by "vs", learn the definition of both terms and also explain the difference between them.	Reading Pages (read before class); N means in lab manual notes
1	8/17	Elemental carbon and Hydrocarbons	Allotrope, activated carbon, fullerene, nanotube; structural isomers, optical isomers, chiral, skeleton formula, structure, condensed structure; alkane, alkene, alkyne	999-top 1002; 902-911
2	8/19	Hydrocarbon nomenclature	Know generic formulas of alkane, alkene, alkyne and know table 20.5; saturated hydrocarbon, unsaturated hydrocarbon, aromatic compounds; cis and trans isomers	912-918, 920-921, 924-925, 927
3	8/21	Functional groups; polymers; review IMF	Functional group, carboxylic acid, alcohol, ester, ether, amine, amide, ketone, aldehyde (know table given in class for functional groups); polymer; hydrogen-bonding, dipole-dipole attractions, dispersion forces, ion-dipole	927-928, 934-936, 938-940, 465-477
4	8/24	Solutions	Solution, solute, solvent, solubility, entropy, miscible, enthalpy of hydration, dynamic equilibrium, saturated, unsaturated, supersaturated, recrystallization, Henry's Law, concentrated; colloid	520-535, 557-559
5	8/26	Solution Concentrations	Molarity, molality; parts by mass, parts by volume (ppt, ppm, ppb); mole fraction	535-540
6	8/31	Vapor pressure; colligative properties	Raoult's Law, colligative property, vapor pressure of solution, freezing point depression, boiling point elevation, osmosis, osmotic pressure	540-545, 548-556
7	9/2	Intro to More Equilibrium; Le Chatelier's Principle	Intensive property, Le Chatelier's Principle, "equilibrium shifts right", "equilibrium shifts left"	N1-N6; 646-652
8	9/4	Equilibrium Constants and Their Use	Law of Mass Action, equilibrium constant, position of equilibrium; know the approximate K values for reaction essentially complete, well to the right, very little reaction, essentially no reaction (N9); be able to explain when it is OK to "neglect x"	N7-N13
9	9/9	Finding Equil. Composition; Predicting Direction of Reaction; Getting New K's from other K's and Reaction Equations	Reaction Quotient (how is this different from K?); Acidity Constants, Basicity Constants, Solubility Product Constant (how are these three different than just K?)	N13-N16

10	9/14	<b>Exam 1</b>		
11	9/16	Common Ion Effect; Will a Precipitate Form?	Common Ion Effect	N17-22
12	9/18	Naming and Recognizing Acids and Bases; $K_a * K_b = K_w$	Bronsted Acid; Bronsted Base; conjugate acid-base pair; $K_w$	N24-N28, N30-N37
13	9/21	Acid-base reactions with a strong reactant; finding the K value		N39-N41
14	9/23	Logs and pH; pH of solutions of acids and bases (no mixing)	pH	N42-N44; text 679-685, 687-690
15	9/28	pH when solutions are mixed; buffers and pH	Buffer; Henderson-Hasselbach equation	N44-N48
16	9/30	Practice pH calculations; solubility and pH		N49-N50
17	10/2	Complex Ions and Crystal Field Theory	Complex ion, ligand, lewis base, coordination compound, formation constant, counterion, coordination number, monodentate, bidentate, polydentate; crystal-field splitting, strong-field ligand, weak-field ligand, complementary color, diamagnetic, paramagnetic; understand the meaning of the order of the spectrochemical series list (you do not have to memorize the list itself)	Text, pp. 759-763, 1050-1053, 1056-1059, 1067-1072
18	10/5	Uses of Complex Ions; Ligands and Solubility		1073-1077; N53-N54;
19	10/7	2nd Law of Thermodynamics, spontaneity, entropy and its increase/decrease; calculating $\Delta S$ .	2nd Law of Thermodynamics; spontaneous reaction (will do this one in class), enthalpy, endothermic, exothermic, entropy	774-785, 793-797
20	10/24	The 2nd law of thermo and Gibbs energy; Signs of $\Delta H^\circ$ , $\Delta S^\circ$ , $\Delta G^\circ$ ; Calculating $\Delta G^\circ$	Surroundings, system, universe; standard Gibbs Free Energy	785-792, 797-802
21	10/14	<b>Exam 2</b>		
22	10/19	“free” energy;	Standard conditions, nonstandard Gibbs Energy, $\Delta G^\circ$ and K; T and K	803-809
23	10/21	Oxidation-reduction Reactions	Oxidation, reduction, redox, oxidizing agent, reducing agent; oxidation numbers	N59-N61; mid N64-65
24	10/23	Balancing redox equations; start electrochemical cells	Half-reaction, potential, voltage, electrochemical cell, standard cell potential;	N66-mid N70

25	10/26	Relative strengths of “agents”; predicting redox reactions; E and kinetics; Nernst equation	Nernst equation	mid N70-N75
26	10/28	concentration cells, voltage and K; LCP and changes in E		Text 839-842, N75-N76(stop at section G); N78 (summary part); N79
27	11/2	Electrolysis	Electrolysis; galvanic cell, electrolytic cell	N81
28	11/4	Rate of reaction; rate law; initial rate method	Reaction rate, average reaction rate, instantaneous reaction rate, rate law, rate constant, order of reaction, method of initial rates	Text 569-579
29	11/6	Integrated rate laws; half-lives	Integrated rate laws (how do they look different than rate law we did before, what variables are in the equation); half-life	580-587
30	11/9	Temperature and rate constant, collision theory	Arrhenius equation, transition state, collision theory	587-594
31	11/11	Mechanisms	Mechanism, rate determining step, elementary step, catalyst, enzyme	594-604; N89-92, #3 and #5 on N94; summary N96
32	11/16	Nuclear chemistry; types of radioactivity and nuclear reactions; kinetics	Radioactive, mass number, alpha particles, beta particles, gamma rays, positron emission, electron capture, half-life	Text 864-874, 875-879
33	11/18	Nuclear Power	Fission, fusion, mass defect, chain reaction, critical mass	883-890
34	11/20	Some Uses of Radioisotopes	PET, Food Irradiation, Industrial Use	
35	<b>11/23</b>	<b>Exam 3</b>		
36	11/30	Intro Biochemistry-lipids	Lipids, fats, oils, fatty acid, saturated, monounsaturated, polyunsaturated, triglyceride, phospholipid, lipid bilayer, steroid	955-961,
37	12/2	Proteins and amino acids	Amino acid, alpha amino acid, zwitterion, dipeptide, polypeptide, fibrous protein, globular protein, primary structure, secondary structure, tertiary structure, quaternary structure, denaturing reaction	966-973

### Fall 2009 Chem 112 Lab

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