

CEE 543, Autumn 2007

Aquatic Chemistry

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Class Sessions: MWF 10:30, T 12:30 More 225

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Office Hrs: TTh 2:30-3:20

Required Text: *Water Chemistry*, Benjamin (McGraw-Hill, 2002) **Note: See [Errata List](#)**

Reference Texts: *A Problem-Solving Approach to Aquatic Chemistry*, Jensen (Wiley, 2003)

Aquatic Chemistry, Stumm and Morgan (Wiley, 1996)

Water Chemistry, Snoeyink and Jenkins (Wiley, 1980)

Aqueous Environmental Geochemistry, Langmuir (Prentice-Hall, 1997)

Principles & Applications of Aquatic Chemistry, Morel and Hering (Wiley, 1993)

Session	Date	Topics	Reading
1	9/26	Introduction; Perspectives on Chemical Equilibrium; Concentration Scales	1-19
2	9/28	Concentration and Activity; Activity Coefficients in Solution	19-51
3,4	10/1,2	Thermodynamic Fundamentals	60-62, 75-96
5	10/3	Thermodynamic Interpretation of Equilibrium	96-127
6	10/4	Acidity Constants, Acid Strength	131-150
7,8	10/8,9	Graphical Representation of Acid/Base Equilibria	150-161
9	10/10	Mass and Charge Balances, Numerical Solutions of Acid/Base Problems	161-185
10	10/12	Graphical Solutions to Acid/Base Problems, Proton Condition	188-230
11,12	10/15,16	Titrations	
13	10/17	Alkalinity	237-257
14	10/19	Buffers	257-276
15,16	10/22,23	Software for Chemical Equilibrium Problems; Mineql+ usage notes, Part 1	276-288
17	10/24	Computer session 1: Acids and Bases	
18	10/26	Gas/Liquid Equilibrium	322-347
19,20	10/29,30	Computer Modeling of Gas/Liquid Equilibrium	347-357
21	10/31	Computer session 2: Gases	
22	11/2	Metals in Solution: Coordination Chemistry and Speciation	362-383
	11/5	VETERANS' DAY HOLIDAY	
23,24	11/6,7	Metals in Solution: Coordination Chemistry and Speciation	383-394
25	11/9	Computer session 3: Metals in Solution	
26,27	11/12,13	Precipitation of Metal Hydroxides	394-404
28	11/14	Precipitation of Metal Carbonates and Phosphates	404-421
29	11/16	Computer session 4: Equilibrium with Known Solids	
30,31	11/19,20	Systems with Potential Precipitation	421-433
23	11/21	NO CLASS	
24	11/23	THANKSGIVING HOLIDAY	
32	11/26,27	Computer session 5: Systems with Potential Precipitation	
33	11/28	The Phase Rule; Predominance Area Diagrams with Solids	433-453
34	11/30	Oxidation-Reduction Reactions; Redox Reactions and Energy	464-496
35,36	12/3,4	Redox Speciation; Redox Titrations and Buffering	496-525
37	12/5	Computer session 6: Redox Equilibrium	525-545
38	12/7	Catch up, Review, Summarize	
	12/10	FINAL EXAM, 8:30-10:20	