

## APPLICATIONS OF AQUATIC CHEMISTRY 16:375:517

Spring 2008

TR 2:15 - 3:35 ENRS Building, Room 223

**Professor:** John Reinfelder, ENRS Building, Room 260, 932-9800 x6211,  
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**Text:** Principles and Applications of Aquatic Chemistry (Morel and Hering, 1993), available at the Cook-Douglass Student Coop, Nichol Ave and Lipman Dr.

**Other References:** Aquatic Chemistry, W. Stumm & J.J. Morgan; The Geochemistry of Natural Waters, J.I. Drever.

**Basis for Grade:** Problem Sets 70%; Report 30%

Jan	22	Introduction and the problem of weak acid equilibrium	(pp. 1-9, 157-161)
	24	The solution: mole balance equations	(pp. 9-29, 40-63)
	29	"	
	31	The graphical method	(pp. 63-69)
Feb	5	Non-ideal effects in aqueous solutions	(pp. 70-93)
	7	Alkalinity and pH in natural waters	(pp. 157-181)
	12	Equilibrium with the gas phase	(pp. 181-191)
	14	Effects of biological processes on alkalinity	(pp. 203-210)
	19	CO <sub>2</sub> hydration kinetics and air-water exchange	(pp. 98-107, 218-227)
	21	CO <sub>2</sub> in the Hudson River and two Georgia estuaries	(Raymond et al., 1997; Cai & Wang, 1998)
	26	MINEQL chemical equilibrium model	(Handout)
	28	Solid dissolution and precipitation	(pp. 236-261)
Mar	4	<i>no class</i>	
	6	<i>no class</i>	
	11	Solid dissolution and precipitation	(pp. 261-276)
	13	MINEQL exercise	
	18	<b>SPRING</b>	
	20	<b>BREAK</b>	
	25	Acquisition and control of alkalinity	(pp. 276-297)
	27	Trace metal speciation in natural waters	(pp. 319-393)
Apr	1	MINEQL exercise	
	3	Biological trace metal uptake: free ion activity model; kinetics	(pp. 395-401, 405-414)
	8	Redox thermodynamics	(pp. 421-439)
	10	Redox thermodynamics	(pp. 466-477)
	15	Energetics of biological redox reactions	(pp. 439-451, 457-459)
	17	MINEQL exercise	
	22	Photochemistry	(pp. 477-494)
	24	Adsorption and solid surfaces I	(pp. 509-535)
	29	Adsorption and solid surfaces II	(pp. 536-556)
May	1	MINEQL exercise	

**Report:** Due Monday, May 12.