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GEOL 570.01: Advanced Aqueous Geochemistry

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Geology 570
Advanced Aqueous Geochemistry
Fall 2002

Nancy W. Hinman
TTh 10:10 - 11:40

SC 353
243-5277

Office Hours: 1:00 – 3:00 Tuesday, 1:30 – 3:30 Wednesday

Objective: My objective in the course is to provide an in-depth understanding of the tools aqueous geochemists use to solve geochemical problems. This is the first semester of a two-semester course. In this semester, we will cover acid-base chemistry, carbonate chemistry, solubility and complexation. The prerequisite is one year of college chemistry.

Evaluation: Students are evaluated on in-class and take home assignments and class participation. Tests are used to document learning. Most tests are take-home, open-book tests because of the technicalities of the material. There are one or two labs (alkalinity and complexation) in the course.

Expectations: At the end of the semester, students are expected to know how to approach questions or problems in aqueous geochemistry that do not involve redox reactions. These questions would include questions about groundwater and surface water systems that are fully oxygenated. Such systems are found throughout the United States. Students should be able to describe and understand chemical behavior in nonreducing environments and understand how to apply kinetic data to natural systems.

Approach: My general approach initially tests what students remember from their introductory chemistry course as each new topic is reviewed. Examples of approaches to solving geochemical problems from my research or from the literature will be used to illustrate topics. In each example, I point out how the approach resembles or differs from the concepts and principles discussed in the course.

Field Trip: We will have one field trip during the semester. Students are required to go on the field trip. In the event that a student is not able to attend, s/he will be required to compose a significant review paper on a topic of my choosing.

Week	Topic
9/3, 5	Introduction, Geochemical cycling
9/10, 12	Dilute solutions, Activity coefficients
9/17, 19	Acid-base chemistry
9/24, 26	Carbonate Chemistry Last Day to Receive a Refund for Classes Dropped, 9/24
10/1, 3	Alkalinity

10/8, 10	Coordination chemistry
10/15, 17	10/15 no class, Coordination chemistry, Last Day to Drop/Add Classes, Change Sections, or Change Grading Options, 10/15
10/22, 24	Chemical weathering
10/29, 31	Aluminosilicate chemistry
11/5, 7	Kinetics
11/12, 14	Kinetics
11/19, 21	Kinetics
11/26	Chemistry of natural waters
12/3, 5	Chemistry of natural waters
12/10, 12	Chemistry of natural waters
12/17	Final Exam, 8:00-10:10 AM