

Text

D. Langmuir, Aqueous Environmental Geochemistry, Prentice Hall

Addito

D.C. Adriano, Trace Elements in Terrestrial Environments, Springer

G. Sposito, The Chemistry of Soils, Oxford University Press

M McBride, Environmental Chemistry of Soils, Oxford University Press

W. Stumm and J. Morgan, Aquatic Chemistry, Wiley-Interscience

F. Morel and J. Hering, Principles and Applications of Aquatic Chemistry, Wiley-Interscience

C. Bethke, Geochemical Reaction Modeling, Oxford University Press

Student directed

This is an inter-disciplinary course with focus on near surface chemical processes involving water and "geomedia". This is considered a follow-on course to an introductory course in geochemistry and/or aquatic chemistry. We will discuss a number of core topics following traditional lecture style (see topics above) then move to student directed topics at the end of the semester. This will give us an opportunity to explore individual topics that are of particular interest to one or more students in substantial detail. An outline of the work plan is below:

- 1) Students should consider what special topics they'd be interested in seeing covered. All topics need to fit within the scope of "Aquatic and Environmental Geochemistry" (to be defined in the first lecture). Some possible topics are listed below, this is not an exhaustive list so be creative.
- 2) We will choose some of the special topics to cover based on class discussion. These topics will be the basis of some additional lecture/discussion at the end of the semester.
- 3) Early in the semester you will select a specific research topic that fits within one of the general special topic areas if the general topic is As, Sb, and Se geochemistry, you might decide to choose Se as your specific research topic).
- 4) Each student will generate an outline and annotated bibliography (and database of research papers) for their research paper

- Influence of fire / disturbance
- Chemistry of extreme and extraterrestrial environments
 - Hydrothermal systems
 - Sea ice chemistry
 - Mars surface chemistry
- Microbial and sediment geochemistry
 - Biomineralization and weathering
 - Marine sediments
- Organic matter
 - Characterization and processing: terrestrial (Arctic, Boreal) and/or marine
 - Ion exchange and complexation
 - Chelators and controls on trace element chemistry
- CO₂ sequestration
 - Carbonation of mafic and ultramafic rocks (abiotic and biotic processes)
 - Solubility of supercritical CO₂ in saline brines (ie reservoir storage)