GG425 -- ENVIRONMENTAL GEOCHEMISTRY
(Due in class, Fri 21 Feb)

HW #2

A. Redox

Chapter 4 problems 1, 2, 6, 8, 15

some notes:
problem 2. This is a solubility problem: With CO_2 present in solution at low pE and basic pH, which material is less soluble, $Fe(OH)_2$ or $FeCO_3$. The least soluble phase will "dominate" the solids (be more abundant) at the conditions specified.

Problem 6.
One can estimate pH and pE by reading off Fig. 4.4 the x and y axis values at the "triple" point intersection of the stability files for Fe^{2+}, $Fe(OH)_2$, and $Fe(OH)_3$
From this one gets pH~9 and pE~5. But these are only approximate values. I would like you instead to solve for these values, as well as [Fe+3], algebraically, by setting up 3 equations to solve for 3 unknowns. The equations will be chemical reactions that define the lines in the pe-pH diagram.

Problem 8. Similar to problem 6, but you are solving for only one unknown.

B. Aquatic Microbial Geochemistry

Chapter 6 problems: 1, 10, 15, 18, 21