HW #2

A. Redox

Chapter 3 problems 1, 2, 6, 8, 15 (same questions in Ed8 and 9 of text, but in chapter 4)

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. Calculate
which of the two solids has lower solubility.

Problem 6.
One can estimate pH and pE by reading off Fig. 3.4 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. All of the relevant equations are given in the
chapter itself, you just need to figure out which ones to se

B. Phase Interactions

Chapter 4 problems 3, 10, 11, 13 (same questions in Ed8 and 9 of text, but in chapter 5)

C. Aquatic Microbial Geochemistry

Chapter 5 problems: 1, 10, 15, 18 (same questions in Ed8 and 9 of
text, but in chapter 6)