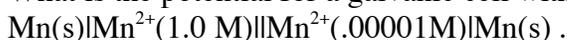


Chem 103 Second Midterm Exam Guide Summer'07

The test will be as scheduled in the syllabus: Friday, August 10, 2007. The test will mainly focus on material covered since the first midterm: namely, Chapters 18 and 19. Study your lecture notes, Group quizzes, ehomework and written homework assignments. Expect to solve problems. Test yourselves by doing problems similar to the homework under time constraints. If you understand the concepts fully, you should be able to do these problems within 10-15 minutes. If not, you need to study and practice further to improve your speed and test taking skills.

The following problems (chapter 19 material only so far) are mentioned to help start (but not limit) your review:

- 1) What is the potential for a galvanic cell with the following cell notation?



(If we did not get a chance to discuss cell notation during the Wednesday lecture, here's an explanation. The "l"s represent the phase boundaries between the components of the galvanic cell. For example, the above notation means a Mn metal electrode immersed in 1 M Mn^{2+} solution, connected by a saltbridge ("||") to a sol'n of .00001M Mn^{2+} sol'n in which Mn(s) is immersed.)

- 2) Balance the most complicated half reactions in table 18-1. (start with only the redox couples)
- 3) Balance: $\text{PbO}_2 + \text{SO}_4^{2-} + \text{Au} \rightarrow \text{PbSO}_4 + \text{Au}^{3+}$
- 4) In the above, identify the reducing agent. Oxidant. Redox couples.
- 5) If the above were the cell reaction for a galvanic cell, which would the anode and the cathode?
- 6) Write the reactions (from memory) describing the rusting process. Describe and bolster with chemical equations and potentials what happens when iron is galvanized.
- 7) Write down the chemical reactions present in the following batteries: dry cell, lead car battery and mercury batteries. Describe their distinguishing properties based on the chemical reactions.
- 8) What is equilibrium constant for a redox reaction whose standard reaction potential is .0134 V? What is the maximum work that this reaction can do?