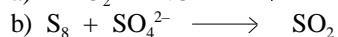
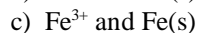
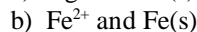
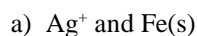


These questions are from a previous exam. They serve only to give you an idea of the sort of questions you might expect on Exam 4 in Chemistry 126. Please note, however, that each year different sorts of problems are introduced, and I make no guarantee that any problems of any particular sort will be included on this year's exam.

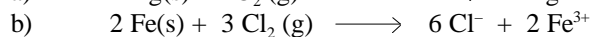
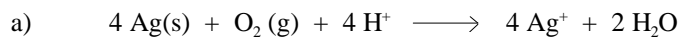
(10) 1. Balance the following two equations in acidic aqueous solution. Indicate the number of electrons transferred, n , in each case.



(15) 2. In each case, using the Table of Selected Standard Reduction Potentials provided, indicate whether we should expect to see a reaction if the two substances listed are placed in contact. If a reaction is expected, indicate what you would expect to observe. (No need to balance the chemical equation, but discussing what the products would be might be helpful.)



(10) 3. In each case, using the Table of Selected Standard Reduction Potentials provided, determine the expected standard cell potential at 25 °C.



(25) 4. Design (sketch) an electrochemical cell based on ONE of the two reactions given in Problem 3. Show the directions of all ion and electron movement, identify the anode and cathode, and indicate the reactions occurring at the two electrodes.

(10) 5. An electrochemical cell is designed based on the following chemical equation:



Provided the cell is run for 20 minutes at a current of 150 mA, how many grams of zinc (MW 65.38) will be required?

(15) 6. An electrochemical cell is designed to utilize the following reaction, for which the standard cell potential is 0.34 V.



a) Write an equation that shows how the actual cell potential will be affected by concentrations of solutes and pressures of gases.

b) Predict the value of the cell potential under the conditions of 0.10 M Cu^{2+} , 2 atm H_2 , and pH 4.0.

c) If the actual cell potential is 0.150 V, $[\text{H}^+] = 1.0 \text{ M}$, and $P(\text{H}_2) = 1.0 \text{ atm}$, what is $[\text{Cu}^{2+}]$?

(15) 7. **This question related to applications in the book and presented in class that year. It's not particularly pertinent to this year's exam. This year expect to write about a poster project (yours, or if that just didn't work out, one of the others).**