CH 223 Worksheet 8

1. A voltaic cell is based on a Co^{2+} / Co half-cell and an AgCl / Ag half-cell. (a) What reaction occurs at the anode? (b) What is the standard cell potential?

2. Using the standard reduction potentials listed in Appendix E (see attached), determine if the following reaction is spontaneous under standard conditions:

$$Hg^{2+}\,(aq) + 2\,I^{-}\,(aq) \rightarrow Hg\,(l) + I_2\,(s)$$

3. For the reaction $3\,Ni^{2+}\,(aq) + 2\,Cr(OH)_3\,(s) + 10\,OH^{-}\,(aq) \rightarrow 3\,Ni\,(s) + 2\,CrO_4^{2-}\,(aq) + 8\,H_2O\,(l)$

(a) What is the value of n? (b) Use the data in Appendix E to calculate ΔG^{o}. (c) Calculate K at T = 426 K.

4. A voltaic cell utilizes the following reaction and operates at 310 K.

$$3\ Ce^{4+}\ (aq) \ + \ Cr\ (s) \rightarrow 3\ Ce^{3+}\ (aq) \ + \ Cr^{3+}\ (aq)$$

(a) What is the emf of this cell under standard conditions?

(b) What is the emf of this cell when $[Ce^{4+}] = 3.0$ M, $[Ce^{3+}] = 0.10$ M and $[Cr^{3+}]$ 0.010 M?

5. An aqueous cadmium (Cd) solution is electrolyzed using a current of 7.60 A. How many grams cadmium will be plated out after 2.00 days?