**Galvanic (Voltaic) Cells Problems**

1. Regarding the following reaction:

F2 (g) + 2 I- (aq) → 2 F-(aq) + I2 (s)

a. List the species being oxidized:\_\_\_\_\_\_ List the species being reduced:\_\_\_\_\_

b. Calculate Eo for this cell.

c. Which species receives electrons from the anode?\_\_\_\_\_   
 d. Which species donates electrons to the cathode?\_\_\_\_\_\_

2. Given the following half-reactions:

Co+2 + 2e- → Co Eo = -0.277 V

Ce+4 + e- → Ce+3 Eo = 1.61 V

a. Write the overall equation for the galvanic cell. Be sure to balance the number of electrons.

b. Calculate the Eo for the cell.

c. Designate which ½ reaction occurs...  
  
 at the anode:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and at the cathode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. Describe the direction of electron flow.

3. Find the following using a voltaic cell with the line notation: Al(s)|Al3+||Pb2+|Pb(s)

a. Calculate the Eo for the reaction.

b. Write the balanced overall REDOX equation for the galvanic cell.

4. Using standard reduction potentials, calculate the cell potential (Eo) for each of the following reactions:

a. H2 (g) + I2 (s) → 2H+(aq) + 2I-(aq)

b. Ni(s) + 2Ce+4(aq) → Ni+2(aq) + 2Ce+3(aq)

5. For the following voltaic cell (solutions at 1.0 M):

Fe(s) | Fe2+(aq) || Cu2+(aq) | Cu(s)

(a). Draw a picture of the cell. Include a salt bridge in your picture.

(b). Write the cell half-reactions.

(b). Label one half-reaction as the oxidation, the other as the reduction.

(c). Label on half-reaction as the cathode, the other the anode.

(d). Label the direction of electron flow, and label one electrode as the cathode and the other electrode as the anode.

(e). Write the overall cell reaction.

(f). Determine the standard voltage (Eo) for the battery

6. Find the following using a voltaic cell containing Cr(s)/Cr3+(aq) along with Co(s)/Co2+(aq)

a. Write the overall equation for the galvanic cell and calculate the Eo for the cell.

b. Draw and describe all parts of the cell.