ELECTROCHEMISTRY REVIEW AND PRACTICE 2

1. For each reaction, write the oxidation and reduction half-reactions, and determine if the reaction is spontaneous.

(a) $Br_2(l) + Sn^{2+}(aq) \rightarrow 2\ Br^-(aq) + Sn^{4+}(aq)$

(b) $3\ Pb(s) + 2\ Cr(NO_3)_3(aq) \rightarrow 3\ Pb(NO_3)_2(aq) + 2\ Cr(s)$

2. Use the oxidation-number method to balance the following redox reaction occurring in basic solution.

$$Cl_2(aq) + Pb^{2+}(aq) \rightarrow ClO_3^-(aq) + Pb(s)$$

3. Use the half-reaction method to balance the following redox reaction occurring in acidic solution.

$$CrO_4^{2-}(aq) + Br^-(aq) \rightarrow Cr^{3+}(aq) + BrO_3^-(aq)$$

4. Using a redox table, predict the reaction that occurs when hydrogen gas is bubbled through an aqueous solution of silver nitrate.

5. Consider the following galvanic cell.

$Al(s) \mid Al(NO_3)_3(aq) \parallel Fe(NO_3)_2(aq) \mid Fe(s)$

(a) Draw a complete, neat, and clearly labelled diagram of the cell.
(b) Label the anode and cathode, and write the half reaction occurring at each.
(c) Draw a wire connecting the two electrodes and show the direction of electron flow in this wire.
(d) Show the direction of movement of anions and cations in the solutions.
(e) Write the balanced net reaction equation for the cell.
(f) Calculate standard cell potential for this cell.