Unit 5 – Chapter 16: Electrochemistry **Name _____**

Assignment #2: E^0 for Voltaic Cells **Period _____**

1) Calculate E^O for the following voltaic cells:
   a. $Pb_{(s)} + 2\ Ag^+_{(aq)} \rightarrow Pb^{2+}_{(aq)} + 2\ Ag_{(s)}$
   b. $O_{2(g)} + 4\ Fe^{2+}_{(aq)} + 4\ H^+_{(aq)} \rightarrow 2\ H_2O_{(l)} + 4\ Fe^{3+}_{(aq)}$
   c. A $Cd\text{-}Cd^{2+}$ half-cell and an $Zn\text{-}Zn^{2+}$ half-cell

2) Using Table 18.1, calculate E^O for the reaction between
   a. chromium (II) ions and tin (IV) ions to produce chromium (III) ions and tin (II) ions.
   b. manganese (II) ions and hydrogen peroxide to produce solid manganese dioxide (MnO_2).

3) Calculate E^O for the following cells:
   a. $Pb \mid PbSO_4 \parallel Pb^{2+} \mid Pb$
   b. $Pt \mid Cl_2, ClO_3^- \parallel O_2, H_2O \mid Pt$
   c. $Pt \mid OH^-, O_2 \parallel ClO_3^-, Cl^- \mid Pt$ (basic medium)

4) Which of the following reactions is/are spontaneous at standard conditions?
   a. $Zn_{(s)} + 2\ Fe^{3+}_{(aq)} \rightarrow Zn^{2+}_{(aq)} + 2\ Fe^{2+}_{(aq)}$
   b. $Cu_{(s)} + 2\ H^+_{(aq)} \rightarrow Cu^{2+}_{(aq)} + H_{2(g)}$
   c. $2\ Br^-_{(aq)} + I_{2(s)} \rightarrow Br_{2(l)} + 2\ I^-_{(aq)}$