

Unit 5 – Chapter 16

Name _____

Assignment #2

Period _____

1) Calculate E° for the following voltaic cells:

- a. $\text{Pb}_{(s)} + 2 \text{Ag}^{+}_{(aq)} \rightarrow \text{Pb}^{2+}_{(aq)} + 2 \text{Ag}_{(s)}$
- b. $\text{O}_{2(g)} + 4 \text{Fe}^{2+}_{(aq)} + 4 \text{H}^{+}_{(aq)} \rightarrow 2 \text{H}_2\text{O}_{(l)} + 4 \text{Fe}^{3+}_{(aq)}$
- c. A Cd-Cd²⁺ half-cell and an Zn-Zn²⁺ half-cell

2) Using Table 18.1, calculate E° 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 (MnO₂).

3) Calculate E° for the following cells:

- a. $\text{Pb} \mid \text{PbSO}_4 \parallel \text{Pb}^{2+} \mid \text{Pb}$
- b. $\text{Pt} \mid \text{Cl}_2, \text{ClO}_3^{-} \parallel \text{O}_2, \text{H}_2\text{O} \mid \text{Pt}$
- c. $\text{Pt} \mid \text{OH}^{-}, \text{O}_2 \parallel \text{ClO}_3^{-}, \text{Cl}^{-} \mid \text{Pt}$ (basic medium)

4) Which of the following reactions is/are spontaneous at standard conditions?

- a. $\text{Zn}_{(s)} + 2 \text{Fe}^{3+}_{(aq)} \rightarrow \text{Zn}^{2+}_{(aq)} + 2 \text{Fe}^{2+}_{(aq)}$
- b. $\text{Cu}_{(s)} + 2 \text{H}^{+}_{(aq)} \rightarrow \text{Cu}^{2+}_{(aq)} + \text{H}_2(g)$
- c. $2 \text{Br}^{-}_{(aq)} + \text{I}_{2(s)} \rightarrow \text{Br}_{2(l)} + 2 \text{I}^{-}_{(aq)}$