

Name: _____

Date: _____

Electrochemistry Practice Test

- Determine the oxidation numbers of the underlined element in the following compounds:
 - $\underline{\text{S}}\text{O}_2$
 - $\underline{\text{Mn}}\text{O}_2$
 - $\underline{\text{Cr}}^{3+}$
 - $\underline{\text{S}}\text{O}_4^{2-}$
 - $\text{H}_3\underline{\text{B}}\text{O}_3$
 - $\text{Na}_2\underline{\text{O}}_2$ (sodium peroxide)
 - $\underline{\text{Sn}}$
 - $\text{K}_2\underline{\text{Cr}}_2\text{O}_7$
- Determine the oxidation number of each element in $(\text{NH}_4)_2\text{CO}_3$.
- Is this a redox reaction? Explain why or why not.

$$\text{Na}_2\text{S} (\text{aq}) + \text{FeCl}_2 (\text{aq}) \rightarrow 2 \text{NaCl} (\text{aq}) + \text{FeS} (\text{s})$$
- Balance each of the following half-reactions, then identify if it represents oxidation or reduction.
 - $\text{SO}_3^{2-} \rightarrow \text{SO}_4^{2-}$ in acidic conditions
 - $\text{CrO}_4^{2-} \rightarrow \text{Cr}_2\text{O}_7^{2-}$ in basic conditions
 - $2 \text{I}^- \rightarrow \text{I}_2$
- Balance each reaction using half-reactions.
 - $\text{NO} + \text{As} \rightarrow \text{N}_2\text{O} + \text{AsO}_2^-$ (in acidic conditions)
 - $\text{Ce}^{4+} + \text{I}^- \rightarrow \text{Ce}^{3+} + \text{IO}_3^-$ (in basic conditions)
- Write each of the following reactions in cell notation, then determine the cell potential:
 - $\text{Cu} (\text{s}) + 4 \text{H}^+ (\text{aq}) \rightarrow \text{Cu}^{2+} (\text{aq}) + 2 \text{NO}_2 (\text{g}) + 2 \text{H}_2\text{O} (\text{l})$
 - $\text{Fe} (\text{s}) + \text{Sn}^{2+} (\text{aq}) \rightarrow \text{Fe}^{2+} (\text{aq}) + \text{Sn} (\text{s})$
 - $\text{Sn}^{2+} (\text{aq}) + 2 \text{Ag}^+ (\text{aq}) \rightarrow \text{Sn}^{4+} (\text{aq}) + 2 \text{Ag} (\text{s})$
- A galvanic cell is set up with tin (Sn^{2+} is the ion) and silver.
 - Write the two half-reactions involved, and identify the anode and cathode.
 - Write the overall reaction for the cell.
 - Calculate the net potential of the cell in standard conditions.
 - Fill in the diagram of the cell below.

