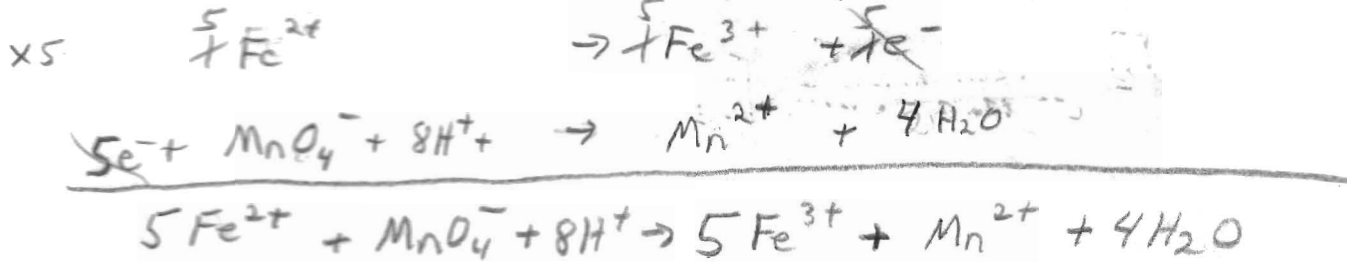
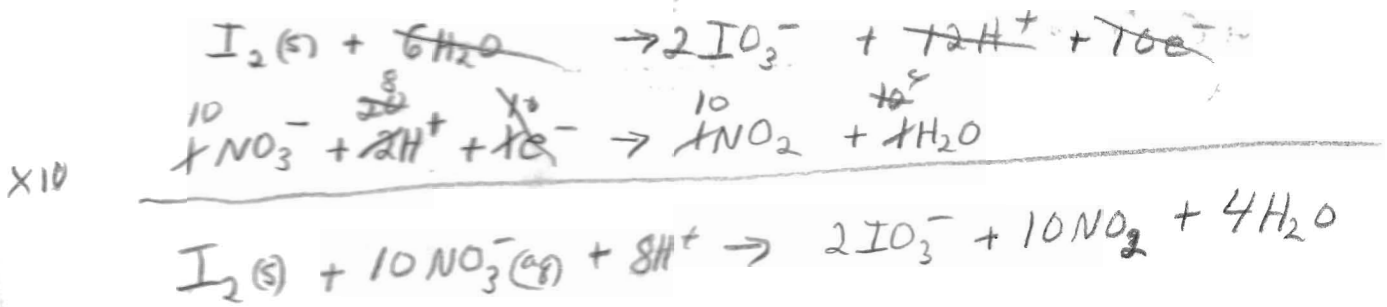


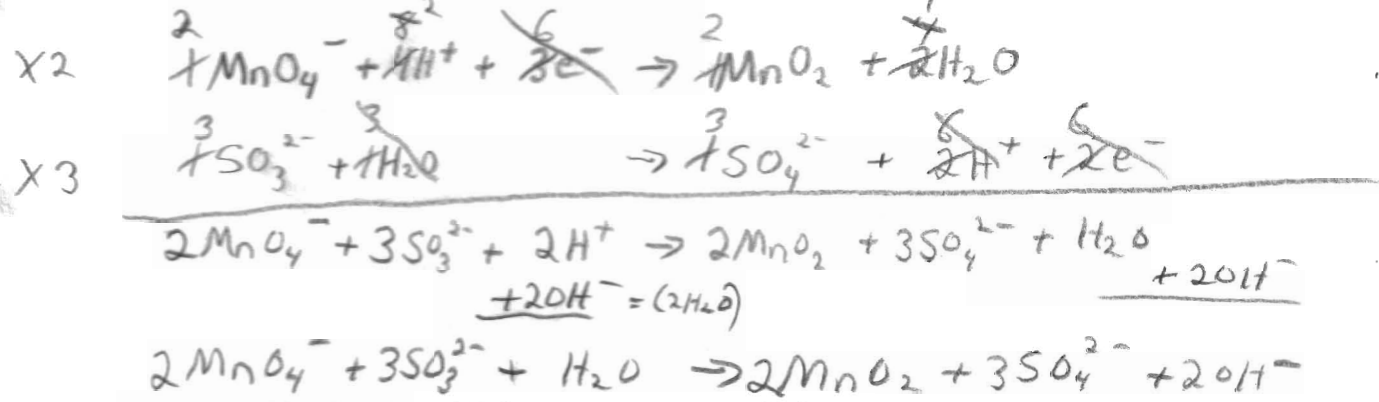
1. (15 Pts) a. $\text{Fe}^{2+} + \text{MnO}_4^- \rightarrow \text{Fe}^{3+} + \text{Mn}^{2+}$ (acidic solution)



b. $\text{I}_2(\text{s}) + \text{NO}_3^-(\text{aq}) \rightarrow \text{IO}_3^-(\text{aq}) + \text{NO}_2(\text{g})$ (acidic solution)



c. $\text{MnO}_4^-(\text{aq}) + \text{SO}_3^{2-}(\text{aq}) \rightarrow \text{MnO}_2(\text{s}) + \text{SO}_4^{2-}(\text{aq})$ (basic solution)

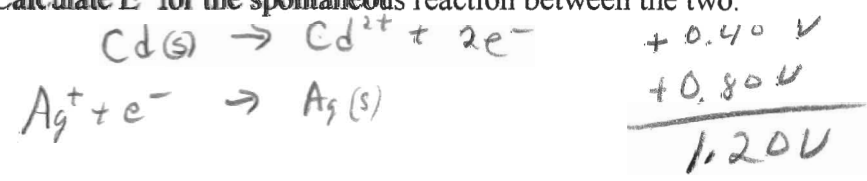


2. (2 Pts) Identify the oxidizing agent and the reducing agent in question 1a.



3. (8 Pts) The standard potentials for $\text{Cd}^{2+}(\text{aq}) + 2e^- \rightarrow \text{Cd}(\text{s})$ and for $\text{Ag}^+(\text{aq}) + e^- \rightarrow \text{Ag}(\text{s})$ are -0.40 V and 0.80 V respectively.

a. Calculate E° for the spontaneous reaction between the two.



b. (ON THE BACK OF THIS PAGE) Draw and label a cell using $\text{Cd}(\text{s})$, $\text{Cd}(\text{NO}_3)_2(\text{aq})$, $\text{Ag}(\text{s})$, $\text{AgNO}_3(\text{aq})$, and $\text{KNO}_3(\text{aq})$. Be sure to label the anode, cathode, show the electron flow direction, the ion flow directions, and the relative size changes of the electrodes. Also show which half reaction occurs at each electrode and label them as oxidation or reduction.

