Problems on electrochemistry - Due of submission 6/12/2015

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1- Which of the following represents Redox reaction:

$C + Cu_2O \rightarrow 2Cu + CO_2$ $SO_3 + H_2O \rightarrow H_2SO_4$ $HBr + NaI \rightarrow HI + NaBr$

2- Rearrange the following according their reducing ability H_2, Mn, Cl^-, Zn

3- Rearrange the following according their oxidizing ability H^+, Mn^{2+}, Cl_2, Zn^{+2}

Knowing that the reduction potentials of each one as follow:

$E^o_{Mn} = -1.180$ V, $E^o_{Zn} = -0.7628$ V, $E^o_H = 0$, $E^o_{Cl} = 1.3895$ V

4- Can Pb replace Fe^{+2} or Cu^{+2} in their solution? if you know that their reduction potentials are: $E^o_{Fe} = -0.44$ V, $E^o_{Pb} = -0.126$ V, $E^o_{Cu} = 0.34$ V

5- $Sn + Pb^{2+} \longrightarrow Sn^{2+} + Pb$

- Calculate the E^o_{cell} of the above cell if you know

  Standard reduction potentials are: $E^o_{Sn} = -0.14$ V, $E^o_{Pb} = -0.126$ V

- Calculate the E_{cell} at 25 ^oC and $[Pb^{2+}] = 0.01$ M, $[Sn^2] = 0.001$ M

- At equilibrium, calculate the equilibrium constant of the above reaction at 25 ^oC.

6- If the standard cell potential at 298 K is 1.10 V for the following reaction

$Zn_{(s)} + Cu^{2+}_{(aq)} \rightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$, then what is the change in Gibbs Free Energy?

7- The equilibrium constant for the reaction: $Ni_{(s)} + Hg_2Cl_{2(s)} \rightarrow 2Hg_{(l)} + 2Cl^-_{(aq)} + Ni^{2+}_{(aq)}$ is 1.8×10^{19} at 298K. What is the value of the standard cell potential $E°_{cell}$ for this reaction?

8- If 612 C of charge is passed through a solution of $Cu(NO_3)_{2(aq)}$, calculate the mass of copper metal deposited. Atomic mass of Cu is 63.0g/mole.