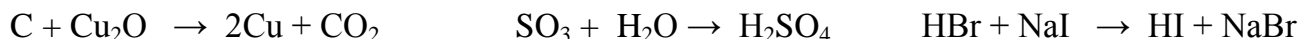


Problems on electrochemistry - Due of submission 6/12/2015

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1- Which of the following represents Redox reaction:



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

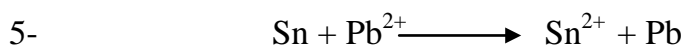
3- Rearrange the following according their oxidizing ability H^+ , Mn^{2+} , Cl_2 , Zn^{+2}

Knowing that the reduction potentials of each one as follow:

$$E^\circ_{\text{Mn}} = -1.180 \text{ V}, \quad E^\circ_{\text{Zn}} = -0.7628 \text{ V}, \quad E^\circ_{\text{H}} = 0, \quad E^\circ_{\text{Cl}} = 1.3895 \text{ V}$$

4- Can Pb replace Fe^{+2} or Cu^{+2} in their solution? if you know that their reduction

potentials are: $E^\circ_{\text{Fe}} = -0.44 \text{ V}$, $E^\circ_{\text{Pb}} = -0.126 \text{ V}$, $E^\circ_{\text{Cu}} = 0.34 \text{ V}$



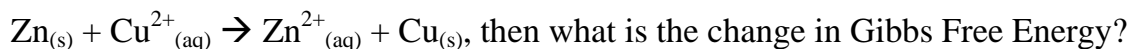
- Calculate the E°_{cell} of the above cell if you know

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

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

- At equilibrium, calculate the equilibrium constant of the above reaction at 25°C .

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



7- The equilibrium constant for the reaction: $\text{Ni}_{(s)} + \text{Hg}_2\text{Cl}_{2(s)} \rightarrow 2\text{Hg}_{(l)} + 2\text{Cl}^-_{(aq)} + \text{Ni}^{2+}_{(aq)}$

is 1.8×10^{19} at 298 K . 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 $\text{Cu}(\text{NO}_3)_{2(aq)}$, calculate the mass of copper metal deposited. Atomic mass of Cu is 63.0 g/mole .