

MC11 Practice

1. For a galvanic cell composed of a nickel electrode and a copper electrode:
 - (a) Draw a picture of a galvanic cell composed of a nickel electrode and a copper electrode
 - (b) Write the overall reaction for the whole system.
 - (c) Write the half reactions for each cell as reductions.
 - (d) Which one should be written as an oxidation?
 - (e) Calculate the standard cell potential.
2. Describe how you will pick an anode and cathode for a given cell with only a table of reduction potentials.
3. Electrons flow (from/to) the anode and (from/to) the cathode.
4. The anode (loses/gains) mass while the cathode (loses/gains) mass.
5. Which way will anions from the salt bridge flow?
 - (a) From anode to cathode
 - (b) From cathode to anode
6. Write the Nernst equation.
7. A voltaic cell is constructed with two $\text{Zn}^{2+}-\text{Zn}$ electrodes. The two compartments have $[\text{Zn}^{2+}] = 1.3 \text{ M}$ and $[\text{Zn}^{2+}] = 1.60 \times 10^{-2} \text{ M}$.
 - (a) Which electrode is the anode of the cell?
 - i. 1.3 M
 - ii. $1.60 \times 10^{-2} \text{ M}$
 - (b) What is the standard emf of the cell? (emf = E_{cell})

(c) What is the cell emf for the concentrations given?

8. A voltaic cell is constructed using the following reaction at 298K:
 $\text{Zn(s)} + \text{Ni}^{2+}(\text{aq}) \longrightarrow \text{Zn}^{2+}(\text{aq}) + \text{Ni(s)}.$

(a) What is the emf of the cell under standard conditions?

(b) What is the emf of the cell when $[\text{Ni}^{2+}] = 3.60\text{M}$ and $[\text{Zn}^{2+}] = 0.110\text{M}$?

(c) What is the emf of the cell when $[\text{Ni}^{2+}] = 0.220\text{M}$ and $[\text{Zn}^{2+}] = 0.990\text{M}$?