DPP –1 [Working and Representation of Galvanic Cell]

Chapter: Electrochemistry

"Sit with your Assignment for just 30 minutes every day. No phone. No switching subjects. No pressure to finish anything."

" Consistency beats motivation. Discipline starts small. Chemistry rewards those who show up daily."

TYPE–1 : Galvanic Cell – Electron/Current Flow & Basic Concepts

1. **In the galvanic cell Cu(s) | Cu^{2+} (1 M) || Ag^{+} (1 M) | Ag(s), the electrons will travel in the external circuit:**
   (1) from Ag to Cu
   (2) from Cu to Ag
   (3) electrons do not travel in the external circuit
   (4) in any direction
2. **The passage of electricity in the Daniell cell when Zn and Cu electrodes are connected is:**
   (1) from Cu to Zn in the cell
   (2) from Cu to Zn out side the cell
   (3) from Zn to Cu outside the cell
   (4) in any direction in the cell
3. **Which of the following statements is TRUE for the electrochemical Daniel cell:**
   (1) Electrons flow from copper electrode to zinc electrode.
   (2) Current flows from zinc electrode to copper electrode.
   (3) Cations move toward copper electrode.
   (4) Cations move toward zinc electrode.

TYPE–2 : Anode vs Cathode – Oxidation & Reduction

4. **Which of the following is not an anodic reaction?**
   (1) $Ag^{+} \rightarrow Ag - e^{-}$
   (2) $Cu \rightarrow Cu^{2+} + 2e^{-}$
   (3) $Fe^{2+} \rightarrow Fe^{3+} + e^{-}$
   (4) $4OH^{-} \rightarrow 2H_2O + O_2 + 4e^{-}$
5. **Which of the following statements is correct:**
   (1) Oxidation occur at anode in both galvanic and electrolytic cell.
   (2) Reduction occurs at anode in both galvanic and electrolytic cell.
   (3) Reduction occur at anode in electrolytic cell where as oxidation occur at cathode in galvanic cell.
   (4) Oxidation occur at anode in electrolytic cell where as reduction occur at anode in a galvanic cell.

6. **In the electrochemical cell**
Pt| H_2(g) 1atm | H^+(1M) || Cu^{2+} (1M) | Cu(s)
Which of the following statements is true?
(1) H_2 is cathode, Cu is anode
(2) Oxidation occurs at Cu electrode
(3) Reduction occurs at H_2 electrode
(4) H_2 is anode, Cu is cathode

TYPE–3 : Salt Bridge – Function & Selection

7. **For an electrochemical cell Ag/Ag^+(0.1 M) || Ag^+/Ag (1M), which of the following electrolyte cannot be used in salt bridge?**
(1) $NaNO_3$ (2) KCl
(3) KNO_3 (4) Both (2) & (3)
8. **Function of salt bridge is/are**

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a. It completes the cell circuit
b. It allows the movement of ions from one solution to other without mixing of the two solutions
c. It maintains the electrical neutrality of the solution in two half cells
(1) a & b (2) a, b & c
(3) Only a (4) b & c
9. **Saturated solution of KNO_3 is used to make salt bridge because**
(1) Velocity of K^+ is greater than that of NO_3^-
(2) Velocity of NO_3^- is greater than that of K^+
(3) Velocity of both K^+ and NO_3^- are nearly the same
(4) KNO_3 is highly soluble in H_2O
10. **Select correct statement.**
(1) If salt bridge is removed, potential falls to zero
(2) KCl cannot be used as electrolyte in salt bridge in case of silver electrode
(3) Cell reaction is spontaneous if emf is positive
(4) All of these

TYPE–4 : Cell Notation & Cell Reactions

11. **The chemical reaction, 2AgCl(s) + H_2(g) $\longrightarrow$ 2HCl (aq) + 2Ag(s) taking place in a galvanic cell is represented by the notation:**
(1) Pt(s)|H_2(g), 1bar|1M KCl(aq)|AgCl(s)|Ag(s).
(2) Pt(s)|H_2(g), 1bar|1M HCl(aq)|1M Ag(aq)|Ag(s).
(3) Pt(s)|H_2(g), 1bar|1M HCl(aq)|AgCl(s)|Ag(s).
(4) Pt(s)|H_2(g), 1bar|1M HCl(aq)|Ag(s)|AgCl(s).
12. **A hypothetical electrochemical cell is shown**

$$A|A^-(xM) \,||\, B^+(yM)|B$$

The emf measured is +0.20 V

The cell reaction is:

(1) $A^+ + B \longrightarrow A + B^+$

(2) $A^+ + e^- \longrightarrow A$, $B^+ + e^- \longrightarrow B$

(3) The cell reaction cannot be predicted.

(4) $A + B^+ \longrightarrow A^+ + B$