DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : CHEMISTRY
DPP No. : 3

Topic :- Electro Chemistry

1 **(d)**

$E^{\circ}_{cell} = \frac{2.303RT}{nF}\log K_{eq}$

$0.295 = \frac{0.0591}{2}\log K_{eq}$

$\therefore \quad \log K_{eq} = 10$

$\therefore \quad K_{eq} = 10^{10}$

2 **(c)**

$k = \frac{1}{R} \times \frac{1}{a} = \frac{1}{32} \times \frac{1.8}{5.4} = 0.0104$

And $\lambda = k \times V = 0.0104 \times 10{,}000 = 104$

3 **(d)**

$E^{\circ} = \frac{0.059}{n}\log K;$

4 **(c)**

$E^{\circ} = \frac{0.059}{n}\log K_c$

$\therefore \; 0.295 = \frac{0.059}{2}\log K_c$

$\therefore \quad K_c = 10^{10}$

5 **(a)**

High value for E°_{red}. Shows more electronegativity *i.e.*, Zn is more electropositive than Fe. ($E^{\circ}_{Zn^{2+}/Zn} < E^{\circ}_{Fe^{2+}/Fe}$)

6 **(b)**

Eq. of Cu = Eq. of Ag

$\therefore \; \frac{W}{63.5/2} = \frac{1.08}{108}$

$\therefore W_{Cu} = 0.3175$ g

7 **(c)**

The cell reaction is

$H_2(g) + I_2(s) \rightleftharpoons 2H^+(aq) + 2I^-(aq)$

$0.7714 = 0.535 - \frac{0.0591}{2}\log\frac{[H^+]^2[I^-]^2}{p_{H_2}}$

$\therefore$ pH = 3

8 **(a)**

$E^{\circ}_{Cr^{3+}/Cr^{2+}} = -0.41$ V

$E^{\circ}_{Mn^{3+}/Mn^{2+}} = +1.57$ V

$E^{\circ}_{Fe^{3+}/Fe^{2+}} = +0.77$ V

$E^{\circ}_{Co^{3+}/Co^{2+}} = +1.97$ V

More negative value of E°_{red} indicates better reducing agent thus easily oxidized. Thus, oxidation of Cr^{2+} to Cr^{3+} is the easiest.

9 **(b)**

In other cells, two liquid are not present.

10 **(d)**

$AgNO_3 \xrightarrow{\Delta} Ag_2O \xrightarrow{\Delta} Ag + O_2$

11 **(a)**

$Cu^{2+} + 2e^- \rightarrow Cu, \quad E^{\circ} = 0.34$

$Zn^{2+} + 2e^- \rightarrow Zn, \quad E^{\circ} = 0.76$

In the cell,

$\underset{\text{anode}}{Cu} \mid Cu^{2+} \parallel Zn^{2+} \mid \underset{\text{cathode}}{Zn}$

In the cell ,

$E^{\circ}_{cell} = E^{\circ}_{cathode} - E^{\circ}_{anode}$

$= 0.76 - (-0.34)$

$= 1.10$ V

12 **(a)**

Here Fe acts as anode while Sn act as cathode. We know that,

$E^{\circ}_{cell} = E^{\circ}_{cathode} - E^{\circ}_{anode}$

$= (-0.14) - (-0.44)$

$= -0.14 + 0.44$

$= 0.30$ V

14 **(d)**

$Ag^+ + e^- \longrightarrow Ag$

$\because$ 96500 C are required to deposite Ag = 108 g

$\therefore$ 965 C are required to deposite Ag

$= \frac{108}{96500} \times 965 = 1.08$ g

15 **(a)**

$\Lambda_m = \Lambda_{eq.} \times$ valency factor;

For NaCl, valency factor = 1;

Molecular conductivity Λ_m is defined as the conductance of all the ions present in a solution containing 1g molecule in it; $\Lambda_{eq.}$ is defined as the conductance of all the ions present in a solution containing 1g equivalent in it.

16 **(a)**

In electrochemical series, iron is placed below sodium, so it cannot displace sodium from

its salt solution. Hence, no reaction takes place.

$Fe + Na_3PO_4 \rightarrow$ No reaction

17 **(d)**

During electrolysis of $NaCl(aq)$, H^+ ions are discharged at cathode and the pH of solution increases due to decrease in$[H^+]$.

18 **(d)**

Galvanic cell is

$Cu\ (s)\ |\ Cu^{2+}\ (aq)\ ||\ Hg^{2+}\ (aq)\ |\ Hg\ (l)$

In the above cell, oxidation of copper and reduction of mercury takes place. Its cell reaction is written as

$Cu\ (s) + Hg^{2+}\ (aq) \rightarrow Cu^{2+}\ (aq) + Hg\ (l)$

19 **(a)**

$$W = \frac{E.i.t}{96500} = \frac{1 \times 0.4 \times 30 \times 60}{96500}$$

$= 7.46 \times 10^{-3}$ g and volume $= \frac{7.46 \times 10^3 \times 22.4}{2}$

$= 0.0836$ litre

20 **(c)**

$$E^\circ_{cell} = \frac{2.303RT}{nF} \log K_{eq}$$

$$E^\circ_{cell} = \frac{0.0591}{n} \log K_{eq} \quad \text{[At 298 K]}$$

$$0.591 = \frac{0.0591}{1} \log K_{eq}$$

$\therefore \quad \log K_{eq} = 10$

$\therefore \quad K_{eq} = 1 \times 10^{10}$

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**D**	**C**	**D**	**C**	**A**	**B**	**C**	**A**	**B**	**D**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**A**	**A**	**A**	**D**	**A**	**A**	**D**	**D**	**A**	**C**