

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : CHEMISTRY
DPP No. : 3

Topic :- Electro Chemistry

1 (d)

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

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

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

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

2 (c)

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

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

3 (d)

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

4 (c)

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

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

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

5 (a)

High value for E_{red}° . Shows more electronegativity *i.e.*, Zn is more electropositive than Fe. (

$$E_{Zn^{2+}/Zn}^{\circ} < E_{Fe^{2+}/Fe}^{\circ}$$

6 (b)

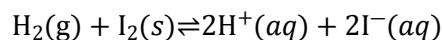
Eq. of Cu = Eq. of Ag

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

$$\therefore W_{Cu} = 0.3175 \text{ g}$$

7 (c)

The cell reaction is



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

$$\therefore \text{pH} = 3$$

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(a)

$$E_{\text{Cr}^{3+}/\text{Cr}^{2+}}^{\circ} = -0.41 \text{ V}$$

$$E_{\text{Mn}^{3+}/\text{Mn}^{2+}}^{\circ} = +1.57 \text{ V}$$

$$E_{\text{Fe}^{3+}/\text{Fe}^{2+}}^{\circ} = +0.77 \text{ V}$$

$$E_{\text{Co}^{3+}/\text{Co}^{2+}}^{\circ} = +1.97 \text{ V}$$

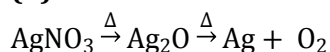
More negative value of E_{red}° indicates better reducing agent thus easily oxidized. Thus, oxidation of Cr^{2+} to Cr^{3+} is the easiest.

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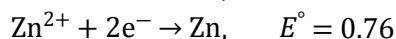
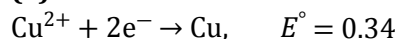
(b)

In other cells, two liquid are not present.

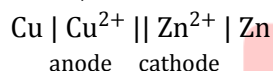
10

(d)

11

(a)

In the cell,



In the cell,

$$\begin{aligned} E_{\text{cell}}^{\circ} &= E_{\text{cathode}}^{\circ} - E_{\text{anode}}^{\circ} \\ &= 0.76 - (-0.34) \\ &= 1.10 \text{ V} \end{aligned}$$

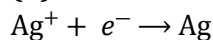
12

(a)

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

$$\begin{aligned} E_{\text{cell}}^{\circ} &= E_{\text{cathode}}^{\circ} - E_{\text{anode}}^{\circ} \\ &= (-0.14) - (-0.44) \\ &= -0.14 + 0.44 \\ &= 0.30 \text{ V} \end{aligned}$$

14

(d)

\therefore 96500 C are required to deposit Ag = 108 g

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

15

(a)

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

For NaCl, valency factor = 1;

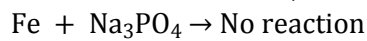
Molecular conductivity Λ_m is defined as the conductance of all the ions present in a solution containing 1g molecule in it; Λ_{eq} is defined as the conductance of all the ions present in a solution containing 1g equivalent in it.

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(a)

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

its salt solution. Hence, no reaction takes place.



17 **(d)**

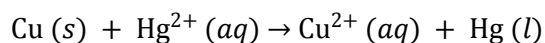
During electrolysis of $\text{NaCl}(aq)$, H^+ ions are discharged at cathode and the pH of solution increases due to decrease in $[\text{H}^+]$.

18 **(d)**

Galvanic cell is



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



19 **(a)**

$$W = \frac{E. i. t}{96500} = \frac{1 \times 0.4 \times 30 \times 60}{96500}$$
$$= 7.46 \times 10^{-3} \text{ g and volume} = \frac{7.46 \times 10^3 \times 22.4}{2}$$
$$= 0.0836 \text{ litre}$$

20 **(c)**

$$E_{\text{cell}}^{\circ} = \frac{2.303RT}{nF} \log K_{eq}$$

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

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

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

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

PE

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

PE