DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : CHEMISTRY
DPP No. : 8

Topic :- Electro Chemistry

1 **(a)**

The metals, present below hydrogen in the electrochemical series, cannot liberate hydrogen from the dilute acids.

Among the given metal only Ag is present below hydrogen in electrochemical series, so it does not evolve hydrogen withdil HCl.

Ag + dil. HCl →No reaction

2 **(b)**

Any cell (like fuel cell), works when potential difference is developed.

3 **(a)**

$t_c = \frac{u_c}{u_a + u_c}, t_a = \frac{u_a}{u_a + u_c}$

Where, u_a and u_c are speed of ion and t_c and t_a are transport number of cation and anions respectively of an electrolyte.

Thus, $t_c + t_a = 1$

4 **(b)**

We know that 1 Faraday charge liberates one gram- equivalent of a metal, hence 0.5 F charge will liberate

$= 0.5 \times 23$

$= 11.50$ g of sodium (E = 23)

5 **(b)**

Current $(i) = 1.5\ A$

Time (t) 10 min $= 10 \times 60 = 600$ s

Quantity of electricity passed $Q = i \times t$

$= (1.5\ A) \times (600\ s)$

$= 900\ C$

Copper is deposited as

$Cu^{2+} + 2e^- \longrightarrow Cu(s)$

2 moles of electrons or $2 \times 96500\ C$ of current deposit copper = 63.56 g

900 C of current will deposit copper

$= \frac{63.56}{2 \times 96500} \times 900$

$= 0.296$ g

6 **(b)**

Ionic mobility depends upon the charge to size ratio of ion. The ionic size in case of hydrated cation is

$K^+(aq) < Na^+(aq) < Li^+(aq)$

7 **(b)**

Eq. of A = Eq. of B = Eq. of C

or $$\frac{2.1}{7/n_1} = \frac{2.7}{27/n_2} = \frac{7.2}{48/n_3}$$

$$0.3\, n_1 = 0.1 n_2 = 0.15\, n_3$$

$\therefore$ $$n_1 = \frac{n_2}{3} = \frac{n_3}{2}$$

If $n_1 = 1$ then $n_2 = 3$, $n_3 = 2$

8 **(d)**

The electrode, which shows colour change during redox process is called indicator electrode.

9 **(c)**

Molar conductivity or molar conductance

$(\Lambda_m) = \kappa \times V$

$\Lambda_m = \kappa \times \frac{1000}{C_m}$

Where, C_m is molar concentration (mol L^{-1})

$\therefore$ Molar conductance $(\Lambda_m) \propto (\frac{1}{C})$

10 **(b)**

Rusting of iron is catalyzed by moist air.

11 **(b)**

$2H_2O + 2e^- \rightarrow H_2 + 2OH^-$

For 0.01 mole H_2, 0.02 mole of electrons are consumed charge required

$= 0.02 \times 96500\, C = i \times t$

Time required $= \frac{0.02 \times 96500}{10 \times 10^{-3}} = 19.3 \times 10^4 s$

12 **(b)**

Metal having higher E°_{OP} replaces the other from its solution.

13 **(a)**

Eq. of Ag = Eq. of H_2;

$$\frac{W}{108} = \frac{5600 \times 2}{22400 \times 1}$$

$\therefore$ $W_{Ag} = 54$ g

14 **(b)**

$Ag^+ + e^- \rightarrow Ag$

9650 C = 0.1 F = 0.1 equivalent Ag

$= 0.1$ mol Ag

$= 10.8$ g Ag

15 **(d)**

More or +ve is E°_{Op} for an electrode more is its reducing power and $vice - versa$.

17 **(b)**

$BeCl_2$ is predominantly more covalent among halides of alkaline earth metals.

18 **(b)**

In $CuSO_4$,change is $Cu^{2+} + 2e \longrightarrow Cu$;

In CuCN, change is $Cu^{+} + e \longrightarrow Cu$;

Thus, $W \propto E_{Cu}$, which is more in CuCN.

19 **(c)**

	E°	nE°			
$Mn^{2+} + 2e^{-} \rightarrow Mn$	-1.18 V	-2.36	$Mn^{3+} + e^{-} \rightarrow Mn^{2+}$	1.51 V	1.51 V
$Mn^{3+} + 3e^{-} \rightarrow Mn$	-0.28	-0.85			

20 **(a)**

$2H^{-} \longrightarrow H_2 + 2e$; Hydrogen in CaH_2 is – ve.

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