(18) $E^\circ_{cell} = 0.44 + 0.337 = \frac{0.059}{2} \log K_{eq}$

$A^{2+} \xrightarrow[\text{Red}^n]{} A \quad E = -0.25$ $\qquad D^{2+} \longrightarrow D \quad -0.402$

$D \longrightarrow D^{2+} \quad E = 0.402$

(26) $2X^- + Y_2 \longrightarrow X_2 + 2Y^-$

$E_{X^-/X_2} > E_{Y^-/Y_2} > E_{W^-/W_2}$

$E_{W^-/W_2} < E_{Y^-/Y_2}$

(27) $Pt \mid Cl_2 \mid Cl^- \,\|\, Ag^+ \mid Ag$

(30) $Ag^+ + e^- \longrightarrow Ag$

$$E = E^\circ_{Redn} - \frac{0.059}{1} \log \frac{1}{0.1}$$

$$= E^\circ_{Redn} - 0.059$$

(32) $2H^+ + 2e^- \longrightarrow H_2$

$$E = E^\circ - \frac{0.06}{2} \log \frac{1}{[H^+]^2}$$

$$= E^\circ - 0.06 \log 10^7$$

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

$2Ag^+ + 2e^- \longrightarrow 2Ag$

$E = E^\circ_{cell} - \frac{0.059}{2} \log \frac{[Cu^{2+}]}{[Ag^+]^2}$

$E' = E^\circ_{cell} - \frac{0.059}{2} \log \frac{[Cu^{2+}] \times 10}{[Ag^+]^2 \times 100}$

$E - E' = \frac{0.059}{2} \log \frac{10}{100}$ 10^{-1}

$= -\frac{0.059}{2}$

$E' - E =$ +ive

$A^{2+} + e^- \rightarrow A$

$Zn \longrightarrow Zn^{2+} + 2e^-$

$Pt \mid \underset{0.1}{Fe^{2+}}, \underset{0.01}{Fe^{3+}} \mid\mid \underset{0.1}{Cu^{2+}} \mid Cu$

$E^{\circ}_{Fe^{2+}/Fe^{3+}} = 0.5$ $\quad E^{\circ}_{Cu^{2+}/Cu} = 0.34$

$E_{cell} = ?$

$2Fe^{2+} \longrightarrow 2Fe^{3+} + 2e^-$ $\quad 0.5$

$Cu^{2+} + 2e^- \longrightarrow Cu$ $\quad 0.34$

$$E_{cell} = 0.84 - \frac{0.06}{2} \log \frac{10^{-4}}{10^{-2} \times 10^{-1}}$$

$$= 0.84 + 0.03$$

$$= 0.87$$

0.84
0.87
0.74
1.47
1.18
0.93

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Q. $Zn \mid Zn^{2+}(0.01M) \parallel Zn^{2+}(0.1M) \mid Zn$

$E_{cell} = ?$

Concentration cell

$E^\circ_{cell} = 0$

Anode $Zn_a \longrightarrow Zn_a^{2+} + 2e^-$ $\quad E^\circ$

Cathode $Zn_c^{2+} + 2e^- \longrightarrow Zn_c$ $\quad -E^\circ$

$Zn_a + Zn_c^{2+} \longrightarrow Zn_a^{2+} + Zn_c(s)$ $\quad E^\circ_{cell} = 0$

$$E_{cell} = 0 - \frac{0.06}{2} \log \frac{[Zn^{2+}]_a}{[Zn^{2+}]_c} = -0.03 \log \frac{0.01}{0.1}$$

$$= +0.03$$

Nishant Jindal

Q. $Ag \mid AgCl$ (saturated soln) $\| Ag^+$ (0.1 M) $\mid Ag$

$K_{sp}(AgCl) = 10^{-10}\ M^2$

$E_{cell} = ?$

$K_{sp} = s^2 = 10^{-10}$

$s = [Ag^+] = 10^{-5}$

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

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

$$E = 0 - \frac{0.06}{1} \log \frac{10^{-5}}{10^{-1}} = +0.06 \times 4 = 0.24$$

0.12
0.18
0.24
0.3

Nishant Jindal

Q $Pt \mid H_2(1bar) \mid HA(0.1M) \parallel Ag^+(0.1M) \mid Ag$

$K_a = ?$

$E^\circ_{Ag^+/Ag} = 0.8$ $\quad E_{cell} = 0.92$

$$H_2 \longrightarrow 2H^+ + 2e^-$$

$$2Ag^+ + 2e^- \longrightarrow 2Ag$$

$$E_{cell} = 0.92 = 0.8 - \frac{0.06}{2} \log \frac{[H^+]^2}{P_{H_2} \times [Ag^+]^2}$$

$$2 \cdot 0.12 = -0.06 \log \frac{[H^+]}{10^{-1}}$$

$$\frac{[H^+]}{10^{-1}} = 10^{-2}$$

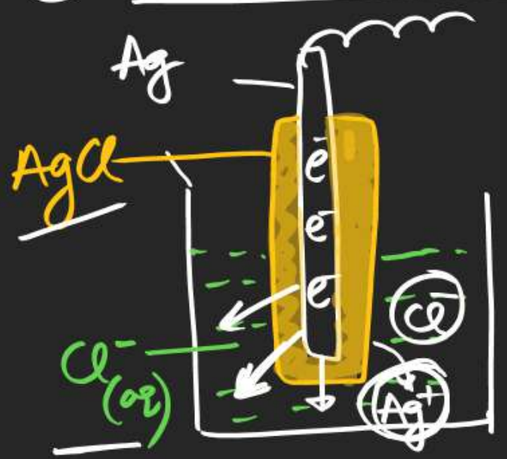
$$[H^+] = 10^{-3} = x$$

$$HA \longrightarrow H^+ + A^-$$

$0.1 - x \quad x \quad x$

$$K_a = \frac{x^2}{0.1 - x} = \frac{(10^{-3})^2}{0.1 - x}$$

(iv) Metal - Metal sparingly soluble salt electrode



If it acts as anode

$$Ag(s) \longrightarrow Ag^+(aq) + e^-$$

$$Ag^+(aq) + Cl^-(aq) \longrightarrow AgCl(s)$$

$$Ag(s) + Cl^-(aq) \rightarrow AgCl(s) + e^-$$

$Ag \mid AgCl \mid Cl^- \parallel$

$E^\circ_{Ag/AgCl/Cl^-}$

$E^\circ_{Ag,Cl^-/AgCl}$

If it acts as cathode

$$Ag^+(aq) + e^- \longrightarrow Ag(s)$$

$$AgCl(s) \longrightarrow Ag^+(aq) + Cl^-(aq)$$

$$AgCl(s) + e^- \longrightarrow Ag(s) + Cl^-(aq)$$

$\parallel Cl^- \mid AgCl \mid Ag$

$E^\circ_{AgCl/Ag,Cl^-}$

$E^\circ_{Cl^-/AgCl/Ag}$

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$$Zn \longrightarrow Zn^{2+} + 2e^- \qquad E^\circ = 0.76 \text{ volt}$$

$$E^\circ_{Zn/Zn^{2+}} = 0.76$$

S – I

1 – 30

Bihar	1 – 14 Feb
Mp	6 – 27 Feb
Up	
Odisa	15 feb – 15 March
Mana	24 Feb – 23 March
WB	15 feb – 27 Feb
Gujrat	14 March – 25 March