1 lit 1 lit

$Fe^{2+} + S^{2-} \longrightarrow \underline{FeS(s)}$ 1.6×10^{17}

(10)

0.03 0.1

0 0.07 ✗

x $0.07 + \cancel{x}$

$$\frac{1}{x \times 0.07} = 1.6 \times 10^{17}$$

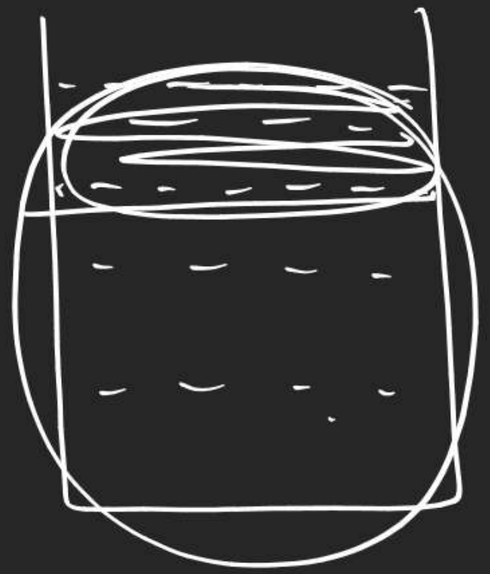
O-II

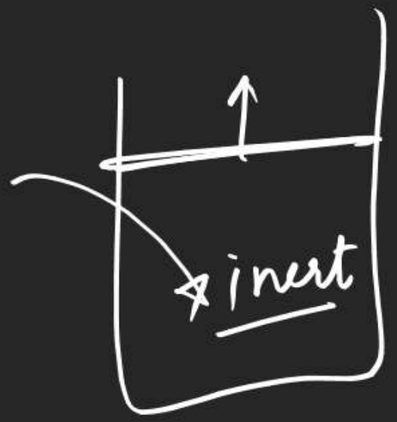
$$\underset{}{HgO(s)} + \underset{a}{4I^-(aq)} + \underset{}{H_2O(\ell)} \rightarrow \underset{b}{HgI_4^{2-}(aq)} + \underset{c}{2OH^-(aq)}$$

$$K_c = \frac{[HgI_4^{2-}][OH^-]^2}{[I^-]^4}$$

$$= \frac{b \times c^2}{a^4} \times \left(\frac{1}{V}\right)^{-1}$$

$$= \frac{b \times c^2}{a^4} \times V$$



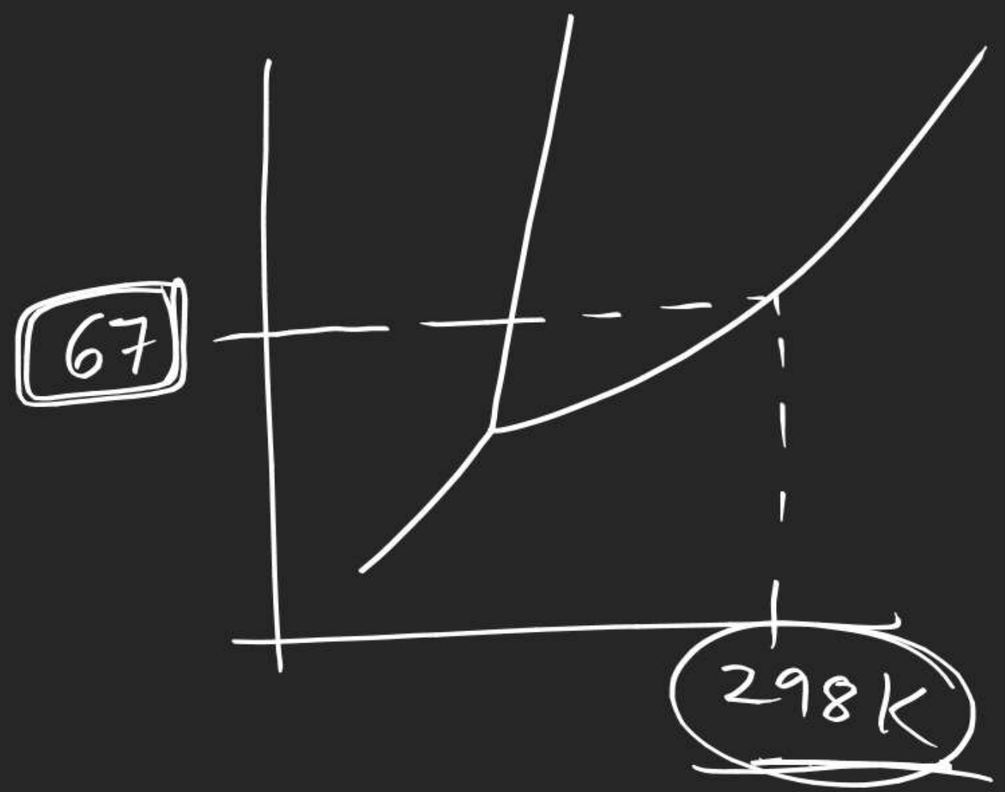


Nishant Jindal

$$I_3^-(aq) \longrightarrow I_2(aq) + I^-(aq)$$

add^n of $H_2O(\ell)$	moles ↓	↑	↑
	conc ↓	↓	↓

Nishant Jindal



Normal b.pt → b.pt at 1 atm

Standard b.pt → b.pt at 1 bar

(14) $Q = (10)^2(20) = 2000 < K_p$

(23) K_p°

(24) (d)

$NO + O_3 \longrightarrow NO_2 + O_2$ (+ 2ω) $\Delta H = -2\omega$

exo

T ↑ backward

(23)

(P) exo

(Q) endo

(R) $2NO_2 \rightarrow N_2O_4$ exo

(S) exo

Nishant Jindal

$$AB \longrightarrow A^+ + B^-$$

$$C - y \qquad y \qquad y - x$$

$$AB + B^- \longrightarrow AB_2^-$$

$$y - x \qquad x$$

$$K_1 = \frac{[A^+][B^-]}{[AB]}$$

$$K_2 = \frac{[AB_2^-]}{[AB][B^-]}$$

$$\frac{K_1}{K_2} = \frac{[A^+]}{[AB_2^-]}[B^-]^2$$

$$K_1 K_2 = \frac{[A^+][AB_2^-]}{[AB]^2}$$

$$\therefore \frac{K_1}{K_2} = \frac{y}{x}(y-x)^2$$

Nishant Jindal

PH-calculation

- Solution containing only acid or base
  - containing only one acid or base
    - Monoprotic or Monohydroxic
      - Strong acid
      - Weak acid
    - polyprotic
  - More than one acid or base
- soln containing salts
- soln containing acid/base + salt (Buffer solution)

Nishant Jindal

① pH of a solution containing strong monoprotic acid or base

Case-I if $C \geq 10^{-6}$ M

$[H^+]$ and $[OH^-]$ due to $H_2O(\ell)$ can be neglected

$[HCl] = C$

$[H^+] = C$

$[NaOH] = C$

$[OH^-] = C$

Case-II if $C < 10^{-6}$ M H^+ and OH^- due H_2O can not be neglected.

$[HCl] = C$

$$H_2O(\ell) \longrightarrow H^+(aq) + OH^-(aq)$$

C

C + x x

$[H^+] = C + x$

$K_W = 10^{-14} = (C+x)(x)$

find pH of

(i) 10^{-2} M HCl $\quad [H^+] = 10^{-2} \quad pH = -\log 10^{-2} = 2$

(ii) 10^{-4} M NaOH $\quad [OH^-] = 10^{-4} \quad pOH = 4 \quad pH = 10$

$pH + pOH = 14$

(iii) 10^{-7} M HCl

$x = ?$

$\sqrt{5} = 2.24$

$H_2O(\ell) \longrightarrow H^+(aq) + OH^-(aq)$

$10^{-7} + x \quad x$

$10^{-14} = (10^{-7} + x)(x)$

$x = 0.62 \times 10^{-7}$

$[H^+] = 10^{-7} + 0.62 \times 10^{-7}$

$= 1.62 \times 10^{-7}$

$\log 2 = 0.3010 \simeq 0.3$

$\log 5 = 0.7$

$\log 3 = 0.4771$

$pH = 7 - \log 1.62$

$= 6.78$

Nishant Jindal

Ionic

0 - I

1 - 8

S - I 1, 2, 5, 6

Chemical Eqlbm JEE - Mains

(29)

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

$$2NH_3 \longrightarrow N_2 + 3H_2$$

$\frac{1}{K_p}$

P_{NH_3} $\quad$ $P/4$ $\quad$ $3P/4$

$$\frac{1}{K_p} = \frac{P/4 \times (3P/4)^3}{P_{NH_3}^2}$$

$$P_{NH_3}^2 = K_p \times P^4 \times \frac{27}{256}$$

$$P_{NH_3} = K_p^{1/2} \times P^2 \times \frac{3^{3/2}}{2^4}$$

(35)

$$K = 1/6 = 2$$

Nishant Jindal

Nishant Jindal

Nishant Jindal