Nishant Jindal

Ionic equilibrium	Class Notes	Tuesday, 28 November 2023
	Live Class For Doubts	Wednesday, 29 November 2023
	O-I: 1, 3, 7, 10, 12, 14, 16, 17, 18, 20, 21, 23, 26, 27, 28, 32, 35, 37, 38, 42, 44, 49, 52, 54, 55, 58, 60, 61, 45, 66, 68, 70, 72, 75, 77, 78, 79, 50, 84, 85, 86, 90, 93, 94, 96, 98	Thursday, 30 November 2023
		Friday, 1 December 2023
Equilibrium	JEE MAIN Selected PYQs	Saturday, 2 December 2023
Redox		Sunday, 3 December 2023
	Class Notes	Monday, 4 December 2023
	O-I: 5, 6, 7, 8, 9, 10, 18, 19, 20, 21, 29, 30, 31, 32, 35, 37, 39, 40, 43, 45, 46, 48, 50, 52, 55, 57	Tuesday, 5 December 2023
	Live Class For Doubts	Wednesday, 6 December 2023
Electrochemistry	Class Notes	Thursday, 7 December 2023
	O-I: 2, 3, 8, 10, 13, 16, 17, 18, 21, 25, 26, 32, 32, 35, 36, 40, 43, 45, 47, 49, 51, 54, 56, 60, 62, 64, 65, 67, 70, 72, 73, 74, 75 77, 78, 79, 82, 84, 87, 88, 89	Friday, 8 December 2023
	JEE MAIN Selected PYQs	Saturday, 9 December 2023
		Sunday, 10 December 2023
Kinetics	Class Notes	Monday, 11 December 2023
	O-I: 3, 4, 6, 8, 9, 14, 15, 20, 23, 25, 28, 29, 31, 32, 33, 38, 40, 43, 45, 48, 50, 52, 54, 56, 57, 56, 61, 64, 65, 68, 70, 71	Tuesday, 12 December 2023
	Live Class For Doubts	Wednesday, 13 December 2023
	JEE MAIN Selected PYQs	Thursday, 14 December 2023
liquid solution	Class Notes	Friday, 15 December 2023
	O-I:2, 3, 5, 7, 15, 18, 19, 21, 22, 24, 26, 29, 32, 33, 37, 40, 44, 46, 49, 51, 53, 57, 58, 64, 66, 67, 68, 71, 73, 75, 77, 79	Saturday, 16 December 2023
		Sunday, 17 December 2023
	JEE MAIN Selected PYQs	Monday, 18 December 2023
Atomic Structure	Class Notes	Tuesday, 19 December 2023
	Live Class For Doubts	Wednesday, 20 December 2023
	O-I: 2, 4, 7, 9, 11, 14, 15, 18, 19, 25, 27, 28, 31, 33, 34, 37, 40, 42, 46, 47, 50, 51, 54, 58, 60, 61, 63, 64, 66, 67	Thursday, 21 December 2023
	JEE MAIN Selected PYQs	Friday, 22 December 2023

(SO) $M + O_2 \longrightarrow$ oxide

$O \longrightarrow O^{2-}$

$E_{oxide} = E_{Metal} + E_{oxygen}$

$= E_{Metal} + 8$

$$\frac{x\ gm}{E_{Metal}} = \frac{y}{E_{metal} + 8}$$

(9) $NH_4OH + H^+ \longrightarrow NH_4^+ + H_2O$

6 2×2 4

2 0

Redox

(39) $42 + 3 = 45$

(9) X

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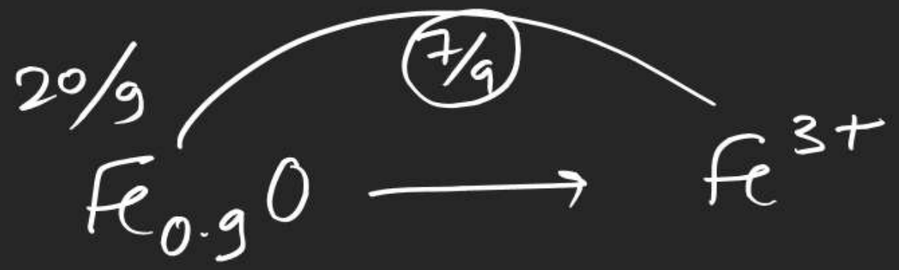
(29)



(21)

$$\eta_f = 0.9 \times 7/9$$

$$= 0.7$$

$$\text{Eq wt} = \frac{M}{0.7}$$

(5)

(2)

(31)

$$Ba(SCN)_2 + 20H_2O \longrightarrow Ba^{2+} + 2SO_4^{2-} + 2CO_3^{2-} + 2NO_3^- + 40H^+ + 32e^-$$

$= +16 + 16$

$= \underline{32}$

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(17) $C_1 = \frac{0.1}{2}$ $\quad C_2 = \frac{2}{45}$

$$[H^+] = \sqrt{K_{a_1}C_1 + K_{a_2}C_2}$$

(18)
$$K_b = \frac{(10^{-4} + x)\,x}{10^{-2} - x}$$

(20)
$$H_3PO_4 \longrightarrow H^+ + H_2PO_4^{2-}$$

$0.1 - x \qquad 0.1 + x \qquad x$

$$K_{a_1} = \frac{0.1 \times x}{0.1} = x$$

$$K_{a_1} = x = 0.1\alpha$$

(c) $10\,K_{a_1}K_{a_2}$

(d) $[PO_4^{3-}] = 100\,K_{a_1}K_{a_2}K_{a_3}$

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$HA \longrightarrow H^+ + A^- \quad K_a = 10^{-4}$

$HA + OH^- \longrightarrow H_2O + (A^-) \quad K = \frac{1}{K_b} = \frac{K_a}{K_w}$

(23) H_2O

$CH_3NH_3^+$

HSO_4^-

(31) $NaCN$

$K_h = \frac{Ch^2}{1-h} = \frac{K_w}{K_a}$

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(35) K_3A

$$A^{3-} + H_2O \longrightarrow HA^{2-} + OH^-$$

$$\frac{K_w}{K_{a_3}} = \frac{x^2}{C - \cancel{x}}$$

(38) HPO_3^{2-}

(52)

HA	NaA	$pK_a = 5$
10 mmol	10 mmol	
$10 - x$	$10 + x$	

$$5.5 = 5 + \log \frac{10+x}{10-x}$$

$$5.2 \times 10^{-3} \times 90$$

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(55) Buffer capacity $= 2.303 \frac{S \times a}{a + S}$

(65) $CH_3COONa + HCl \longrightarrow CH_3COOH + NaCl$

$\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$

$K_a = \frac{x^2}{0.1 - x}$

(58) (A)

	HCl	NaOH
	1 mmol	10 mmol
	0	9 mmol
		200

(13)

	HCl	NaOH
	5.5	4.5
	1	0

$\frac{1}{100} = 10^{-2}$

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$$H_3PO_4 + NaOH \rightarrow NaH_2PO_4 + H_2O$$

9	5	0
4	0	5

$$pH = pK_{a_1} + \log \frac{5}{4}$$

$$K_b = \frac{K_w}{K_a}$$

$Ag_2CrO_4(s) \longrightarrow 2Ag^+ + CrO_4^{2-}$

	$2Ag^+$	CrO_4^{2-}
	100×0.1	400×0.2
	10	80
	0	75

$$(S)^2 \times \left(\frac{75}{500} + S\right) = K_{sp}$$

(94)

4×10^{-5}

$- 10^{-5}$

3×10^{-5}

$(10^{-5})\,[Ag^+] = 10^{-10}$

(10^{-5})

$4 \times 10^{-5} \times \frac{100}{1000}$

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NaOH

$Na_2CO_3 \longrightarrow NaHCO_3 \xrightarrow{HCl} H_2CO_3$

Na_2CO_3 (y) → $NaHCO_3$ (y)

0.1 N H_2SO_4

0.1 N HCl

$x + y = 30 \times 0.1 = 3$

$y = 20 \times 0.1 = 2$

(98)

$$Ag^+ + NH_3 \longrightarrow Ag(NH_3)^+$$

	0.1	0.9	0
	0	0.8	0.1
	x	0.8 + x	0.1 − x

$$Ag(NH_3)^+ + NH_3 \longrightarrow Ag(NH_3)_2^+$$

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(13) $Pb(NO_3)_2 + Cr_2(SO_4)_3 \longrightarrow PbSO_4 + Cr(NO_3)_2$

(15) $Ag^+ + 2NH_3 \longrightarrow Ag(NH_3)_2^+$

	$a/2$	
0.8	$a/2 - 1.6$	0.8
0	$a/2 - 1.6 + 2x$	$0.8 - x$
$x = 5 \times 10^{-8}$		

(14)

$$S = \sqrt{K_{sp}\left(1 + \frac{[H^+]}{K_a}\right)}$$

(2)

$$= \frac{2\omega \times 0.01 + 4\omega \times 0.01 \times 2}{6\omega}$$

$$[H^+] = \frac{2+8}{6\omega} = \frac{10}{6\omega} = \frac{1}{60}$$

$$pH = +\log 60$$

$$= \log 10 \times 6$$

$$= 1 + 0.78$$