CHEMISTRY PAPER – II (SOLUTION)

21. (B)

As H_3PO_3 is diprotic acid

So, $\Delta H_{ionisation} = (55.84 \times 2) - (106.68)$

$= 5$kj/mole

22. (A)

As the particle in sol migrate towards cathode i.e. particles of sol are positively charged so, higher the negative charge , more will be the co-agulation power and lower will be the co-agulating value so, $Na_3PO_4 < Na_2SO_4 < NaCl$.

23. (B)

$2Pb(NO_3)_2(s) \rightleftharpoons 2PbO(s) + 4NO_2(g) + O_2(g)$. $\Delta H > O$

(a) As reaction is endothermic therefore it will go in forward direction hence moles of PbO will increase

(b) With the increase or decrease of volume partial pressure of the gases will remain same.

(c) Due to the addition of inert gas at constant pressure reaction will proceed in the direction in which more number of gaseous moles are formed.

24. (A)

25. (A)

26. (A)

27. (B)

28. (B)

29 (B) – 30 (A)

$pH = pKa + \log \frac{[Base]}{[Salt]}$

$[Base] = \frac{0.01 \times 500}{500} = 0.01$

$[NH_4^+] = \frac{a \times 2}{500}$; Let 'a' millimole of $(NH_4)_2SO_4$ are added.

$\therefore$ $[Salt] = [NH_4^+]$

$pH = 9.26 + \log \frac{0.01}{2a/500}$

$\therefore$ $a = 25$.

$\therefore$ Mole of $(NH_4)_2SO_4$ added $= 0.025$.

$HCl + NaCN \rightarrow NaCl + HCN$

a	0.1	a	0
0	(0.1 - a)	a	a

$\therefore$ $pH = pKa + \log \frac{[Salt]}{[Acid]}$

$8.5 = 14 - 4.61 + \log \frac{[0.1-a]}{a}$

$\therefore \quad \frac{[0.1-a]}{a} = 0.1288$

$\therefore \quad a = 8.8 \times 10^{-2}$

31. (B) – 32. (D)

	A	→	2B	+	C
At, t = 0	2a		0		a
At, $t = t_1$	2a-x		2x		a + x
At, $t = t_x$	0		4a		3a

So, $7a \alpha 35$ or $a \alpha 5$

Now, $3a + 2x \alpha \frac{35}{2}$

$x \alpha 1.25$

So, A_t $t = t_1$, pressure of gas 'B' is 2x i.e. 2.50 bar

Also,

$$K = \frac{2.3}{t_1}\log_{10}\frac{2a}{2a - x} = \log 64 - \log 49$$

$$\text{or} \quad \frac{2.3}{t_1}\log_{10}\frac{10}{10\text{-}1.25} = \log 8^2 - \log 7^2$$

so $t_1 = 1.15$

33. (B) – 34. (A)

$$NH_4I_{(s)} \rightleftharpoons NH_{3(g)} + HI_{(g)}$$

$$0.25 \qquad 0.25$$

$$\text{So, } Kp = 0.25 \times 0.25 = 625 \times 10^{-4}$$

Now, when HI Starts decomposing, then the equilibrium of NH4I(s) shifts to forward direction

$2HI$	$\rightleftharpoons$	H_2	+	I_2
$\begin{pmatrix} 0.25 - 2x \\ +y \end{pmatrix}$		x		x

$NH_4I_{(s)}$	$\rightleftharpoons$	$H_{3(g)}$	+	$HI_{(g)}$
		$\begin{pmatrix} 0.25 \\ +y \end{pmatrix}$		$\begin{pmatrix} 0.25 - 2x \\ +y \end{pmatrix}$

35. (A)

$$\frac{n_A/t}{n_A/t} = \frac{P_A}{P_B}\sqrt{\frac{M_B}{M_A}}$$

$$\frac{n_1M_1 + n_2M_2}{n_1 + n_2} = \text{Mmix or } X_1M_{.1} + (1 - x_1)M_2 = \text{Mmix}$$

$$\Rightarrow \quad X_1 = \frac{2}{5}.\ X_2 = \frac{3}{5}$$

$$\Rightarrow \quad \frac{X_A}{X_B} = \frac{2}{3}\sqrt{\frac{72}{128}} = \frac{1}{2}$$

36. (D)

$$\text{Initially } r_A = \frac{1000 - 800}{5} = 40 \text{ torr/s}$$

In the mix.

$M = X_AM_A + (1 - X_A)M_B$

$$\Rightarrow \frac{472}{5} = X_A \times 128 + (1 - X_A)72 : \frac{472}{5} = 56X_A + 72$$

$472 = 280X_A + 360 : X_A = \frac{112}{280} = \frac{2}{5} = X_B = \frac{3}{5}$

The mix.

$\frac{r_A}{r'_A} = \frac{P_A.A'_1}{P'_A.A_2}; \frac{r_A}{r'_A} = \frac{1}{2} \times \frac{x^2}{xx\frac{3x}{2}} = \frac{1}{3}$

$r'_A = 3r_A = 3 \times 40 = 120$ torr/s; $\frac{r'_{A^\circ}}{r'_{B^\circ}} = \frac{P'_A}{P'_B}\sqrt{\frac{M_B}{M_A}}$

= $r_B' = 240$ torr/s

After 10 sec

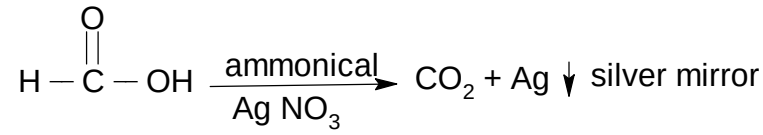
$P_A'' = 2000 - 120 \times 10 = 800$ torr : $P_B'' = 3000 - 240 \times 10 = 600$torr

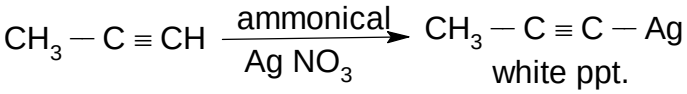
$\frac{n_A}{n_B} = \frac{4}{3}$

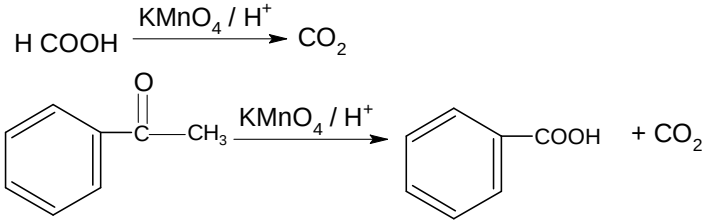
37. $A \to P,Q,R;\ B \to Q;\ C \to P,S;\ D \to P,S$

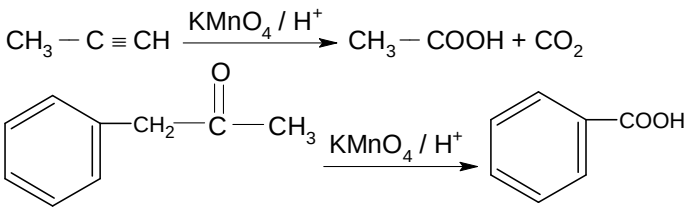
38. $A \to S;\ B \to R;\ C \to P;\ D \to Q$

39. A – P , R; B – P , Q , R , S ; C – Q; D – Q , S

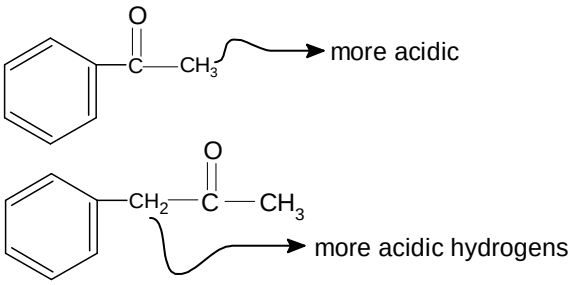


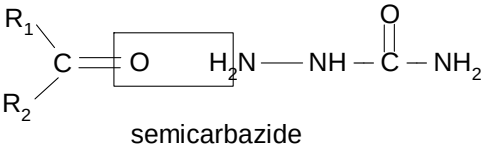




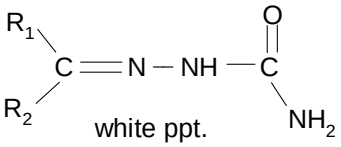


all these compounds can decolorize $KMnO_4$





semicarbazide



white ppt.
(semicarbazone)

40. (a) – (R) ; (b) – (P) (c) – (Q) (d) – (S)