DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 2

Topic :- SOLUTIONS

1 **(c)**

Rest all are applications of distribution law.

2 **(a)**

According to Raoult's law, for non volatile solute, the relative lowering of vapour pressure of a solution is equal to the mole fraction of the solute

$$\frac{p - p_s}{p} = \frac{n}{n + N}$$

4 **(b)**

$$\text{Molarity}(m) = \frac{M}{1000d - MM'} \times 1000$$

Where M' = molar mass of solute

$$3 = \frac{M \times 1000}{1000 \times 1.11 - M \times 40}$$

$$1000M = 3330 - 120\ \text{M}$$

$$1120\ M = 3330$$

$$M = \frac{3330}{1120} = 2.9732$$

5 **(a)**

An ionic compound having $\Delta H_l > \Delta H_h$ is insoluble in water.

6 **(d)**

These are conditions for the validity of distribution law.

7 **(c)**

Volume of monobasic acid $= 10cm^3$

Normality of monobasic acid $= 0.1$ N

Volume of NaOH solution$= 15cm^3$

Normality of NaOH solution $=?$

$$N_1 V_1 = N_2 V_2$$

(for monobasic acid) (for NaOH)

$$10 \times 0.1\ N = 15 \times N_2$$

$$N_2 = \frac{1N}{15} = 0.066\ N$$

8 **(c)**

Molality $(m) = \frac{M}{1000d - MM_1} \times 100$

M = Molarity

M_1 = Molecular mass

d = density

$= \frac{2.05}{(1000 \times 1.02) - (2.05 \times 60)} \times 100$

$= 2.28 \text{ mol kg}^{-1}$

9 **(d)**

According to question,

$w_A = x\text{g}, \; m_A = 18, \; x_A = 1 - 0.6 = 0.4$

$w_B = 69\text{g}, \; m_B = 46, \; X_B = 0.4$

We know that,

$$X_A = \frac{n_A}{n_A + n_B}$$

or $$0.4 = \frac{w_A/m_A}{\frac{w_A}{m_A} + \frac{69}{46}}$$

$$0.4 = \frac{x/18}{\frac{x}{18} + \frac{3}{2}}$$

$$0.4 \times \left(\frac{2x + 54}{36}\right) = \frac{x}{18}$$

or $2x+54=5x$

or $3x=54, x=18$ g

10 **(a)**

$\Delta H_{\text{solution}} = \Delta H_{\text{hydration}} + \Delta H_{\text{lattice energy}}$

$\Delta H_{\text{h}} = -\text{ve}$

$\Delta H_{\text{l}} = +\text{ve}$

11 **(b)**

Molarity Molarity of a solution is the number of moles of the solute per litre of solution. Unit of molarity is mol/L.

12 **(b)**

$$M = \frac{w}{m \times V(\text{L})}$$

$$0.25 = \frac{w}{106 \times 0.25}$$

$\therefore w = 6.625$ g

13 **(d)**

$K_4[Fe(CN)_6]$ furnishes maximum ions (*ie*, 5) thus, it has maximum value of van't Hoff factor

14 **(d)**

For ternary electrolyte;

$P_1 = CST = 0.05 \times 3 \times S \times T;$

For B; $2P = 0.1 \times S \times T;$

$\therefore \quad P_1 = 3P$

15 **(a)**

$\Delta T_f = \text{molality} \times K_f$

$= \frac{68.5 \times 1000}{342 \times 1000} \times 1.86$

$= 0.372$

$\therefore \ T_f = 0 - 0.372 = -0.372$ C

16 **(a)**

According to Raoult's law

$p = p_A^\circ X_A + p_B^\circ X_B$

$= 290 = 200 \times 0.4 + p_B^\circ \times 0.6$

$p_B^\circ = 350$

17 **(c)**

Molarity, $M = \frac{W_2 \times 1000}{M_2 \times Vol.(mL)}$; where w_2 mass of H_2SO_4 in g, M_2 is the molar mass of H_2SO_4

$w_2 = \frac{1 \times 98 \times 200}{1000} = 19.6\ g$

$H_2SO_4 + 2H_2O \rightleftharpoons 2H_3O^+ + SO_4^{2-}$

But according to equation 1 mole of H_2SO_4 gives 2 mole of $[H_2O^+]$ ions. So, the amount of H_2SO_4 to prepare 200 mL solution having the 1 M concentration oH_3O^+ ions is $19.6/2 = 9.8$ g.

18 **(a)**

$N_1V_1 = N_2V_2$

0.164 M NaOH ≅ 0.164 N NOH

$N_1 = ?, V_1 = 25$ mL, $N_2 = 0.164, V_2 = 32.63$ mL

$N_1V_1 = N_2V_2$

or $N_1 = \frac{N_2V_2}{V_1}$

$= \frac{0.164 \times 32.63}{25}$

$= 0.214$ N H_2SO_4

0.214 N $H_2SO_4 \cong \frac{0.214}{2} M\ H_2SO_4$ ($\because$ Basicity of $H_2SO_4 = 2$)

$\cong 0.107$ M H_2SO_4

19 **(c)**

$\Delta T = K_f \times m,$

$\therefore \ 10 = 1.86 \times m;$

or $m = 5.376$

20 **(a)**

A gas is more soluble if (i) More are forces of attractions among molecules of gases,
ii) More being the tendency of ionization in a solvent and
iii) More is H-bonding .

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