DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 10

Topic :- SOLUTIONS

1 **(a)**

$\pi V = nST$ for glucose and blood; If isotonic $\pi_{\text{glucose}} = \pi_{\text{blood}}$;

Thus, $7.65 \times V = \frac{w}{180} \times 0.0821 \times 310$

$\therefore \frac{w}{V} = 54.1$ g/litre or 5.41%

2 **(d)**

Van't Hoff factor for association$(i) = 1 - \alpha + \frac{\alpha}{n}$

Given $\alpha = 1$ and $n = 3$.

3 **(b)**

Vapour pressure is characteristic property of a solvent at a temperature.

4 **(a)**

$\therefore \quad \Delta T = \frac{1000 \times K'_f \times w}{W.m}$

$9.3 = \frac{1000 \times 1.86 \times 50}{62 \times W}$

$\therefore \quad W = 161.29$

$\therefore$ Ice separated $= 200 - 161.29 = 38.71$ g.

6 **(a)**

The order of osmotic pressure of $BaCl_2$, NaCl and sucrose is

$BaCl_2$ >NaCl>sucrose

Since, $BaCl_2$ gives maximum ion (3 ions) in the solution.

7 **(c)**

Mole fraction of $A = \frac{\text{moles of } A}{\text{total moles}}$

Given,

moles of Ar = 1, moles of $CO_2 = 2$,

moles of $O_2 = 3$, moles of $N_2 = 4$,

moles of O_2 removed = 1

Mole fraction of O_2 at initial stage

$= \frac{3}{1+2+3+4} \times 100 = \frac{3}{10} \times 100 = 30$

Mole fraction of O_2 at final stage

$= \left(\frac{3}{10} - \frac{2}{1+2+2+4}\right) \times 100$

$=\left(\frac{3}{10}-\frac{2}{9}\right)\times 100=\frac{70}{9}\cong 8$

$\therefore$ % change $=\frac{8}{30}\times 100=26\%$

8 **(d)**

$K=\frac{c_1}{c_2}$

9 **(a)**

Osmosis is a bilateral movement of solvent particles through semipermeable membrane and only net flow (more from dilute solution to concentrate solution) is noticed.

10 **(d)**

These are conditions for the validity of distribution law.

11 **(b)**

$i=\frac{\text{Normal mol.wt.}}{\text{Exp. mol.wt.}}$

12 **(d)**

Aqueous solution of any substance (non-volatile) freezes below 0°C because the vapour pressure of the solution becomes lower than that of pure solvent.

13 **(c)**

$\frac{\pi_1}{\pi_2}=\frac{T_1}{T_2};$

$\therefore\ \frac{\pi_1}{2}=\frac{546}{273};\quad \therefore\ \pi_1=4$ atm.

14 **(a)**

ΔT_f depends upon K_f of solvent.

15 **(c)**

Given,

Weight of non-volatile solute,

w= 25 g

Weight of solvent, W=100 g

Lowering of vapour pressure,

$p^{\circ}-p_s=0.225$ mm

Vapour pressure of pure solvent,

$p^{\circ}=17.5$ mm

Molecular weight of solvent (H_2O), M=18 g

Molecular weight of solute, m=?

According to Raoult's law

$$\frac{p^{\circ}-p_s}{p^{\circ}}=\frac{w\times M}{m\times W}$$

$$\frac{0.225}{17.5}=\frac{25\times 18}{m\times 100}$$

$$m=\frac{25\times 18\times 17.5}{22.5}$$

$$=350\ g$$

16 **(d)**

Let x mL of HCl are taken , then

$$N_1V_1 = N_2V_2$$

$$\frac{1}{2} \times x = \frac{1}{10} \times 500$$

$$x = 100\text{mL}$$

Hence, water needed to add

= 500-100= 400mL

17 **(a)**

$$\frac{p^0 - p_s}{p^0} = \text{molality} \times (1 - \alpha + x\alpha + y\alpha)$$

The value of $p^0 - p_s$ is maximum for $BaCl_2$

18 **(d)**

Ideal solution obeys Raoult's law at every range of concentration. So, the second component must follow.

Raoult's law in the range. When x_2 is $0 \leq x_2 \leq 1$.

19 **(c)**

Mole fraction of $H_2O = \frac{\frac{80}{18}}{\frac{80}{18} + \frac{20}{24}} = \frac{68}{77}$

20 **(c)**

$\text{Molality} = \frac{\text{mole of solute}}{\text{wt. of water in kg}} = \frac{18 \times 1000}{180 \times 500} = 0.2\ m$

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