DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 1

Topic :- SOLUTIONS

2 **(d)**

$p = P_A^\circ X_A + P_B^\circ x_B$

$\Rightarrow \quad 84 = 70 \times 0.8 + P_B^\circ \times 0.2$

$84 = 56 + P_B^\circ \times 0.2$

$P_B^\circ = \frac{28}{0.2} = 140$ mm

3 **(c)**

As the colligative properties depend only upon the number of particles of solute, so if the non-volatile solute dissociate or associates in the solution, the value of colligative properties deviates, *i.e.,* abnormal colligative properties are obtained.

4 **(b)**

Osmosis a slow process occurs from dilute to concentrated solution.

5 **(d)**

At triple point, all the three phase exist together.

($P = 2.56$ mm, $T = 0.0098$ C)

6 **(c)**

Molality depends only upon weights, not on volumes whereas other given concentration terms depend upon the volume of solution. Volume of solution increases with rise in temperature but temperature does not affect the weights, therefore molality is independent of temperature .

7 **(d)**

Addition of glycol lowers the freezing point of water and thus, glycol water mixture is used as antifreeze in radiators of cars.

8 **(b)**

Given,

R=8.314 $JK^{-1}\ mol^{-1}$

$T_f = 273 + 16.6 = 289.6\ K$

$L_f = 180.75\ Jg^{-1}$

$k_f = ?$

$k_f = \frac{R.T_f^2}{1000 \times L_f}$

$$= \frac{8.314 \times (289.6)^2}{1000 \times 180.75}$$

$$k_f = 3.86$$

9 **(b)**

$$\Delta T_f = K_f m$$

$$= \frac{1.86 \times 45 \times 1000}{62 \times 600}$$

$$= 2.2$$

Freezing point of solution =273.15K-2.2 K

=270.95 K

10 **(c)**

The phenomenon in which, when two solutions of different concentration (one may be solvent) are kept separated by semipermeable membrane, the solvent molecules start flowing from dilute solution to concentrate solution. This is called osmosis. Osmosis is a slow process and keeps on happening until the concentration of both solutions become equal.

11 **(b)**

Methanol has low boiling point than H_2O, lower is boiling point of solvent more is vapour pressure

12 **(d)**

Each system is non-ideal and shows $\Delta H_{\text{mix}} < 0$.

13 **(d)**

Moles of glucose $= \frac{18}{180} = 0.1$

Moles of $H_2O = \frac{178.2}{18}$ 9.9

According to Raoult's law

$$\frac{P^\circ - P_s}{P^\circ} = X_{\text{solute}}$$

$$\frac{17.5 - P_S}{17.5} = \frac{0.1}{10}$$

so, $P_s = 17.325$mm Hg

14 **(a)**

$$P_M = P_A^0.X_A + P_B^0.X_B$$

$$P_M = P_A^0.X_A + P_B^0\,(1 - X_A)$$

$$760 = 520.X_A + 1000 - 1000\,X_A$$

$$\therefore \quad X_A = \frac{240}{480} = 0.5$$

$$\therefore \quad \text{mole \%} = 50$$

15 **(c)**

$$i = \frac{\text{Exp.colligative properties}}{\text{Normal colligative properties}}$$

Put colligative properties $\propto \frac{1}{\text{mol.wt.}}$

16 **(b)**

For isotonic solutions, $\pi_1 = \pi_2$(and for non-electrolytes also $c_1 = c_2$).

17 **(c)**

$$C = \frac{5}{342} \times \frac{1}{100} \times 1000 = \frac{50}{342} \text{ mol/L}$$

$$\pi = \frac{50}{342} \times 0.082 \times 423 = 5.07 \text{ atm}$$

18 **(a)**

$$\Delta T_f = \frac{1000\, K_f w_1\, (i)}{m_1 w_2}$$

$$\therefore \quad 6 = \frac{1000 \times 1.86 \times w_1 \times 1}{62 \times 4000}$$

$$w_1 = 800\ g$$

19 **(a)**

Let molality of solution $= x$

Moles of solute in 1000 g benzene

$$= \frac{1000}{78} = 12.82$$

Mole fraction of solute $= \frac{x}{x + 12.82}$

$$0.2 = \frac{x}{x + 12.82}$$

or $0.2(x+12.82)=x$

or $0.2x+2.564 = x$

$2.564 = x - 0.2x$

$$x = \frac{2.564}{0.8} = 3.2$$

20 **(d)**

This is the mathematically modified form of distribution law when solute undergoes association in either of the solvent.

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