DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 4

Topic :- SOLUTIONS

1 **(b)**

Substances of high vapour pressure (*e*.g., gasoline) evaporates more quickly than substances of low vapour pressure (*e*.g., motor oil).

2 **(b)**

Lowering of vapour pressure is a colligative property, *i.e.,* depends only upon the number of particles of solute and not on the nature of solute. ∵ 0.1 M Glucose ⟶ remains undissociated

0.1 m $BaCl_4 \rightarrow Ba^{2+} + Cl^- \Rightarrow 3\ ions$

0.1 m $MgSO_4 \rightarrow Mg^{2+} + SO_4^{2-} \Rightarrow 2\ ions$

0.1 M NaCl $\rightarrow Na^+ + Cl^- \Rightarrow 2\ ions$

∴ 0.1 m $BaCl_2$gives maximum number of particles, hence it exhibits maximum lowering of vapour pressure.

3 **(d)**

Amount of gas dissolved per unit volume ∝ pressure of gas; this is Henry's law.

4 **(b)**

Osmotic pressure (π)=CRT

Here, C = concentration of solution

$C=\frac{n}{V}$

$n=\frac{w}{m}=\frac{\text{weight in gram of substance}}{\text{mol.weight ofsubstance}}$

V=1L

$C=\frac{68.4}{342}$

$\pi=\frac{68.4}{342}\times 0.082\times 273$

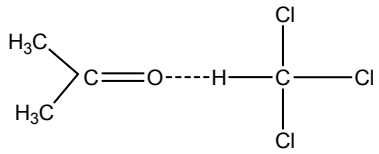
=4.48 atm

5 **(a)**

Molarity gets affected as it is the number of moles per unit volume (volume increases with increase of temperature).

6 **(c)**

The solution of acetone and chloroform shows negative deviation from Raoult's law because acetone and chloroform make the hydrogen bond.



So

ΔH_{mix} *and* ΔV_{mix} *both are negative.*

7 **(d)**

$P'_A = P^0_A \,.\, X_A$ and $\quad P'_A = P_M \cdot X'_A$

$P'_B = P_M \cdot X'_B$

$$\therefore \frac{P'_A}{P'_B} = \frac{X'_A}{X'_B} = \frac{(n_A)_V}{(n_B)_V}$$

8 **(d)**

$$\frac{P_0 - P_s}{P_s} = \frac{w \times M}{m \times W}$$

$$\frac{10}{(750-10)} = \frac{2 \times 78}{m \times 78},$$

$\therefore \quad m = 148;$

m comes 150 if formula $\frac{P_0 - P_s}{P_0}; \frac{w \times M}{m \times W}$ is used. But this is only for dilute solutions.

9 **(d)**

—do—

10 **(c)**

For same solution $\frac{\Delta T_f}{\Delta T_b} = \frac{K'_f}{K'_b}$ *or* $\Delta T_f = \Delta T_b \times \frac{K'_f}{K'_b}$

or $\quad \Delta T_f = \frac{0.15 \times 1.86}{0.512} = 0.545$

Now on diluting the solution to double

$$\Delta T_f \propto \frac{1}{\text{wt. of solvent}}$$

$\therefore \quad \Delta T_f = \frac{0.545}{2} = 0.272$

$\therefore \quad$ f.p. $= -0.272$ C

11 **(c)**

$\pi V = nST$

or $\pi = cST$

$\therefore c = \frac{0.821}{0.0821 \times 300} = 0.033\ M$

12 **(d)**

$\because$ 20 g glucose is dissolved in 100 mL solution

$\therefore$ 1 g glucose is dissolved in $= \frac{100}{20}$

180 g (g-mole) glucose is dissolved in

$= \frac{100 \times 180}{20} = 900$ mL

$= 0.9$L

13 **(d)**

$\Delta T_f = \frac{1000\, k_f w}{mW}$

$\Delta T_f = 0.19°C$; $k_f = 5.08$ kg mol^{-1}, w=1g, W=80g

$M = \frac{1000 k_f w}{\Delta T_f W}$

$= \frac{1000 \times 5.08 \times 1}{0.19 \times 80} = 334.21$

Atomic weight of As =74.92

Hence, number of atoms $= \frac{334.21}{74.92} \approx 4$

Hence, the formula of arsenic is As_4.

14 **(d)**

Reverse osmosis involves movement of solvent particles through semipermeable membrane from concentrated solution to dilute solution under pressure.

15 **(a)**

When ethylene glycol is added to H_2O as antifreeze, it decreases the freezing point of H_2O in winter and increase the boiling point of water in the summer.

16 **(b)**

Elevation in boiling point is colligative property and depends upon number of ions of molecules or particles.

$CaSO_4 \rightarrow Ca^{2+} + SO_4^{2-}$ $\therefore$ 2 ions

$BaCl_2 \rightarrow Ba^{2+} + 2Cl^-$ $\therefore$ 3 ions

$NaCl \rightarrow Na^+ + Cl^-$ $\therefore$ 2 ions

urea $\rightarrow$ no dissociation $\therefore$ 1 molecule

$\because BaCl_2$furnishes maximum ions.

$\therefore BaCl_2$ will have maximum boiling point.

17 **(d)**

K_2SO_4 is 17.4 ppm *i.e.*

10^6 g (≅mL)has $K_2SO_4 = 17.4$ g K_2SO_4

10^3 mL has $K_2SO_4 = \frac{17.4 \times 10^3}{10^6} = 0.0174$ g / L

$= \frac{0.0174}{174}$ mol/L

$\therefore [K_2SO_4] = 1 \times 10^{-4}\ M$

$K_2SO_4 \rightleftharpoons 2K^+ + SO_4^{2-}$ $\therefore [K^+] = 2 \times 10^{-4}\ M$

18 **(a)**

$\frac{p° - p_s}{p°} = X_1$ (mole fraction of solute)

20 **(a)**

$m = \frac{k_b \times w \times 1000}{\Delta T_b \times W} = \frac{2.16 \times 0.15 \times 1000}{0.216 \times 15} = 100$

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