افكار حل المسائل- د/هناء ابو المجد

(1) No of mole (n) = mass / molar mass

(2) Mole fraction (X_A) = (n_A)/(n_A+n_B), X_B = 1- X_A

(3) Molarity (M) = (n of solute)/ (V of soln (L))

(4) Molality (m) = (n of solute)/ (mass of solvent (Kg))

(5) for any problem, if it says there is a solution contains **x %** of solute, this means that:

the mass of solute = x grams and the mass of solvent = (100 – x) grams

(6) for any problem, if it gives volume of liquid and you need its mass:

use the density to convert the volume to mass (density = mass/volume) او العكس

(7) Hennery's law: Gas in liquid has solubility m_1 at P_1, and solubility m_2 at P_2 so $\mathbf{m_1/m_2 = P_1/P_2}$

الضغوط يجب ان يكون لها نفس الوحدة و كذلك الذوبانية

(8) Raoult's law: Two volatile liquids (A, B). V.P of pure A = P^0_A and V.P of pure B = P^0_B

So, partial pressure of any liquid in solution: $P_A = x_A . P^0_A$ and $P_B = x_B . P^0_B$

and P_{total} (or $P_{solution}$) = $P_A + P_B = x_A . P^0_A + x_B . P^0_B$

(9) if B is non-volatile solute, so P_{total} (or $P_{solution}$) = $P_A = x_A . P^0_A$

the difference between V.P of pure solvent and solution (lowering in V.P) or **(ΔP) = $X_B . P^o_A$**

(10) Calcuation of B.P (or F.P) of solution:

First calculate molality (m), then apply in: **$\Delta T_b = K_b . m\,i$** **or** **$\Delta T_f = K_f . m\,i$**

Use K_b or K_f **for solvent** (from table page 64)

i = 1 for nonelectrolytic solute, *i* = number of ions for electrolytic solute

Then: B.P (solution) = B.P (solvent) + ΔT_b and F.P (solution) = F.P (solvent) + ΔT_f

(be carfule K_f is negative value)

(11) If the molar mass of solute is needed!

From the given, you should calculate (ΔT) from ($T_{solution}$) – ($T_{solvent}$),

then calculte m = $\Delta T/(K.i)$, then calculate n = (m × $kg_{solvent}$),

then calculate the molar mass of solute = (n × $mass_{solute}$)

(12) If the % of dissossiation (ionization) of electrolytic solute is need:

From the given you should calculate **($i_{measured}$) = $\Delta T/(K.m)$**

Then divide **[**($i_{measured}$)/ (number of ions of solute)**]** x 100 = ionization of that solute

(13) Calculation of osmotic pressure (π)

First calculate (molarity) from equation (1), (3)

and convert temperature to absolute T (K)= t(^{o}C)+273, then apply in:

π = M . R .T (use R = 0.082 L . atm/mol. K) to obtain the pressure in (atm).