Colligative Properties

Ideal solution: The solutions which obey Raoult's Law at every range of concentration and at all temperatures are Ideal Solutions. We can obtain ideal solutions by mixing two ideal components that are, solute and a solvent having similar molecular size and structure. For Example, consider two liquids A and B, and mix them.

Non ideal solution: The solution which obey Raoult's law over the entire range of concentration are known as ideal solutions. When a solution does not obey Raoults's law it is called as non-ideal solution.

Colligate the V.P. lowering caused by the addition of 100 gm of sucrose (mol/mass 342) to 1000 g of water if the V.P. of pure water at 25 degree is 23.8 mm Hg.

Sln:

According to Raoult's law: $\left(\frac{P-Ps}{P}\right) = \frac{dP}{P} = \frac{n}{n+N}$ ---------- (i)

Where,

dP= Lowering of V.P.

P = V.P. of water = 23.8 mm Hg

n = moles of Sucrose = $\frac{100}{342} = 0.292\ mole$

N = moles of water = $\frac{1000}{18} = 55.5\ mole$

Substituting values in equation (i)

$\frac{dP}{23.8} = \frac{0.292}{0.292+55.5}$

dP = $\frac{0.292}{0.292+55.5} \times 23.8$ = 0.125 mm Hg

So, the lowering of V.P. is = 0.125 mm Hg.