Unit 2
Solutions

Abnormal molar masses:

- Colligative properties depends upon no of particles in solution.
- For the solutes which undergo either association or dissociation, the molar mass calculated will be either more or less than expected. Such molar masses are called Abnormal molar masses.
- Van't Hoff introduced Van't Hoff factor to account for the extent of dissociation or association.

$$\text{Van't Hoff factor (i)} = \frac{\text{Normal molar mass}}{\text{Abnormal molar mass}}$$

$$= \frac{\text{Observed colligative properties}}{\text{Calculate colligative properties}}$$

- By including Van't Hoff factor, colligative properties are modified as,

  (i) Relative Lowering of Vapour Pressure (RLVP)

$$\frac{P^o - P}{P^o} = i\chi_2$$

  (ii) Elevation in boiling point $\Delta T_b = iK_b m$.

  (iii) Depression in freezing point = $\Delta T_f = iK_f m$.

  (iv) Osmotic pressure $\pi = iMRT$.