

Mathematically

$$\frac{P^0 - P^s}{P^0} = x_2$$

Here P^0 = Pressure of solvent in pure stage.

P^s = Pressure of solution

x_2 = Mole fraction of solute.

DERIVATION OF THE LAW

Pressure of solvent in solution

= Mole fraction of solvent \times pressure of solvent in pure stage

If solute is non-volatile

Total pressure of solution = Pressure due to solvent

= Mole fraction of solvent \times pressure of solvent in pure stage

So $P_{\text{solvent}} = x_1 \cdot P_{\text{solution}}$ Here x_1 is mole fraction of solvent.

$$\frac{P_{\text{solvent}}}{P_{\text{solution}}} = x_1$$

Subtract each term from 1 on both side.

$$1 - \frac{P_{\text{solvent}}}{P_{\text{solution}}} = 1 - x_1$$

$$\frac{P_{\text{solution}} - P_{\text{solvent}}}{P_{\text{solution}}} = x_2$$

2.11 IDEAL & NON-IDEAL SOLUTION

Sr.	Ideal solution	Non-Ideal solution
1.	A solution which obey Roult's law is called ideal solution.	A solution which do not obey Roult's law is called non-ideal solution.
2.	Interaction between components of mixture i.e.-between A&B is some as found in A-A & B-B molecule.	Interaction between components of mixture i.e.-between A&B is not some as found in A-A & B-B molecule.

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Yijin Wang



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