

AZEOTROPE

Definition: Azeotrope is a mixture of two or more liquids that has a constant boiling point at a given pressure and the same composition in both liquid and vapour phases.

Types of Azeotropes:

1. Minimum Boiling (Positive Deviation): Boiling point lower than pure components. Vapour pressure high. Example: Ethanol + Water

2. Maximum Boiling (Negative Deviation): Boiling point higher than pure components. Vapour pressure low. Example: Nitric Acid + Water

Raoult's Law Relation: Boiling point is inversely proportional to vapour pressure.

Positive deviation → High vapour pressure → Low boiling point

Negative deviation → Low vapour pressure → High boiling point

Important Properties:

- Constant boiling point at constant pressure
- Same composition in liquid and vapour
- Relative volatility = 1
- Cannot be separated by simple fractional distillation

Methods of Separation:

- Change in pressure
- Addition of entrainer
- Extractive distillation
- Membrane separation

Shortcut Logic: Positive deviation = Low B.P. |

Negative deviation = High B.P.