

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

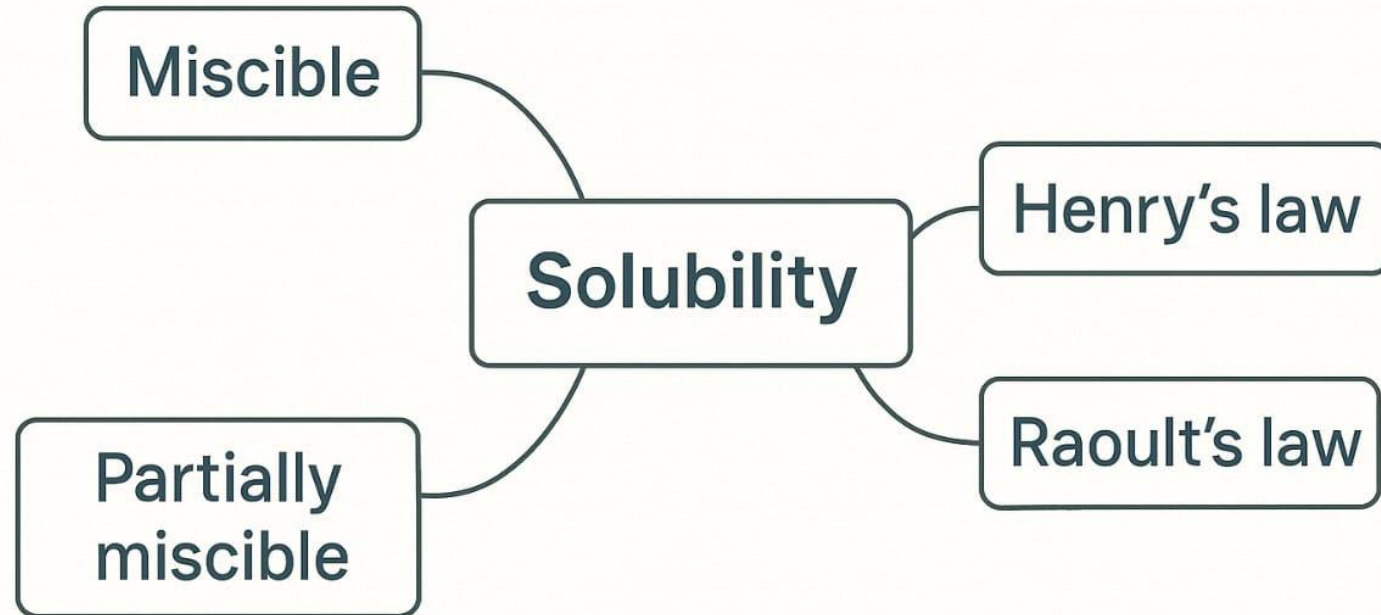


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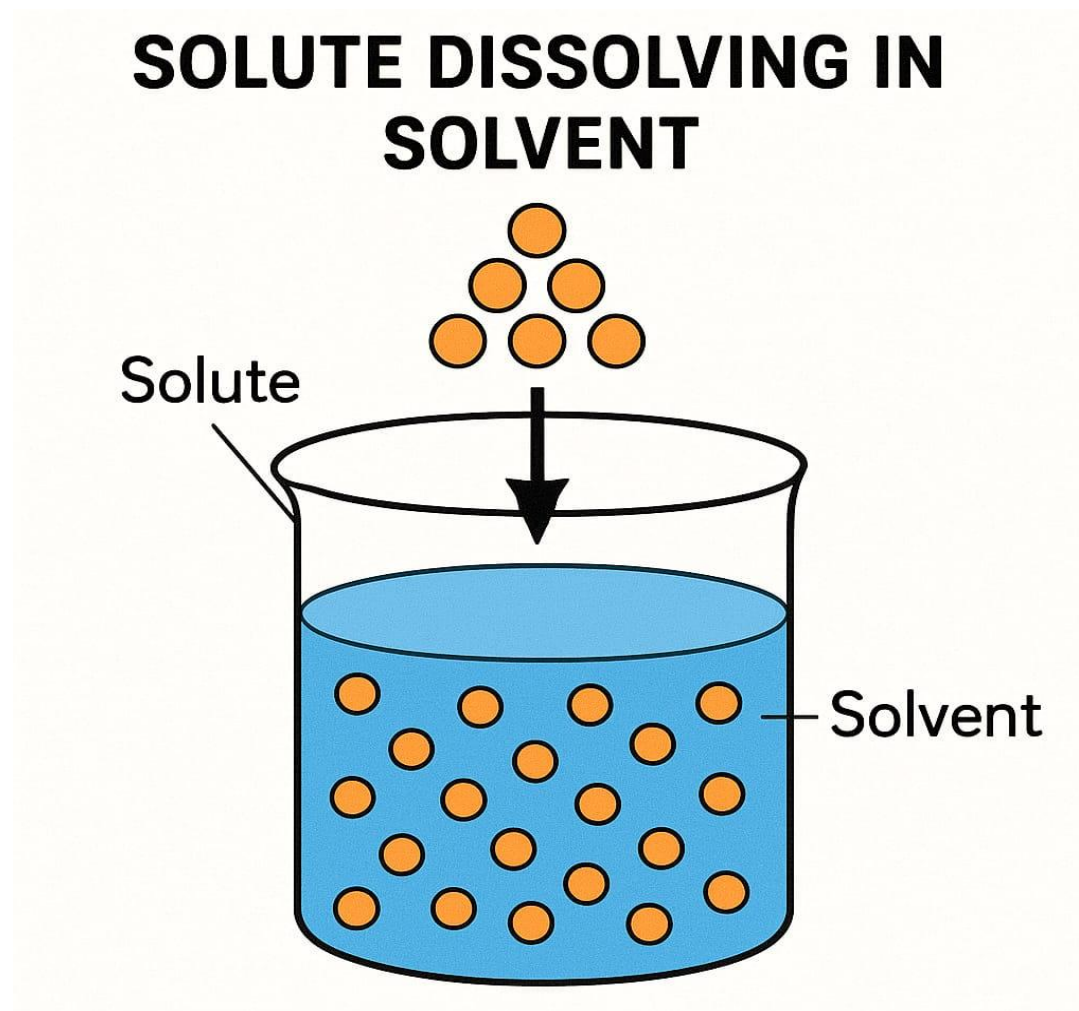
COURSE NAME :PHYSICAL PHARMACEUTICS (BP 302 T)

III SEM / II YEAR

TOPIC 1 : Solubility in Liquids: Gases and Liquids



Introduction to Solubility

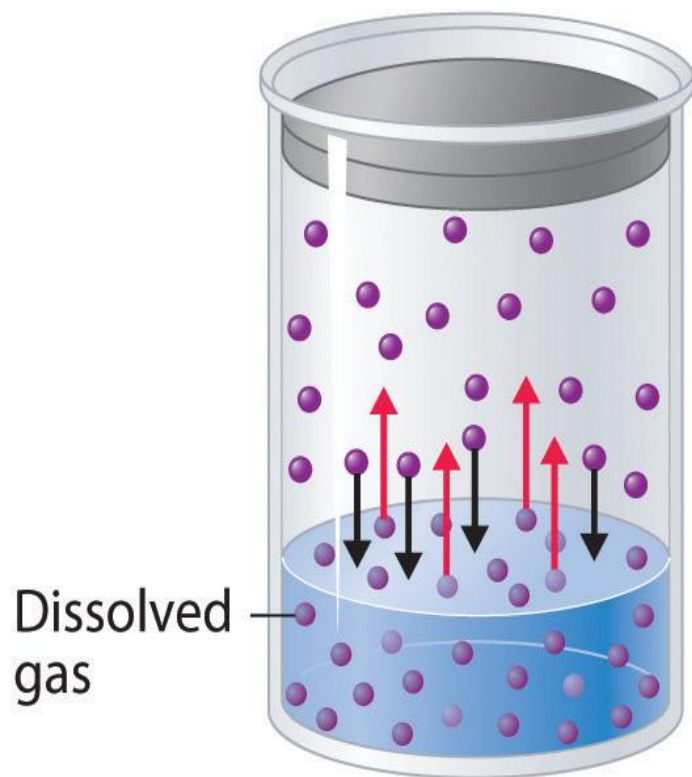


Solubility of Gases in Liquids

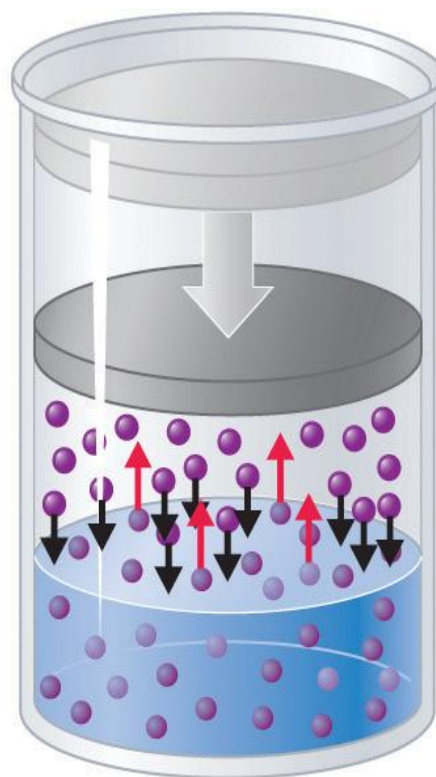


Equilibrium concept in gas solubility

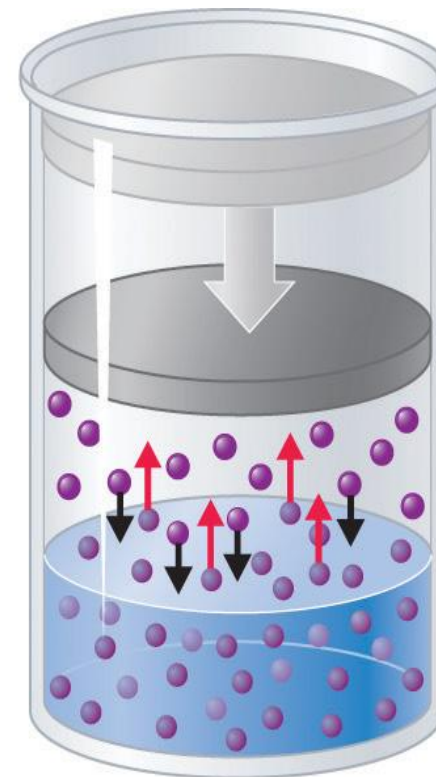
Factors Affecting Gas Solubility



(a) Dynamic equilibrium

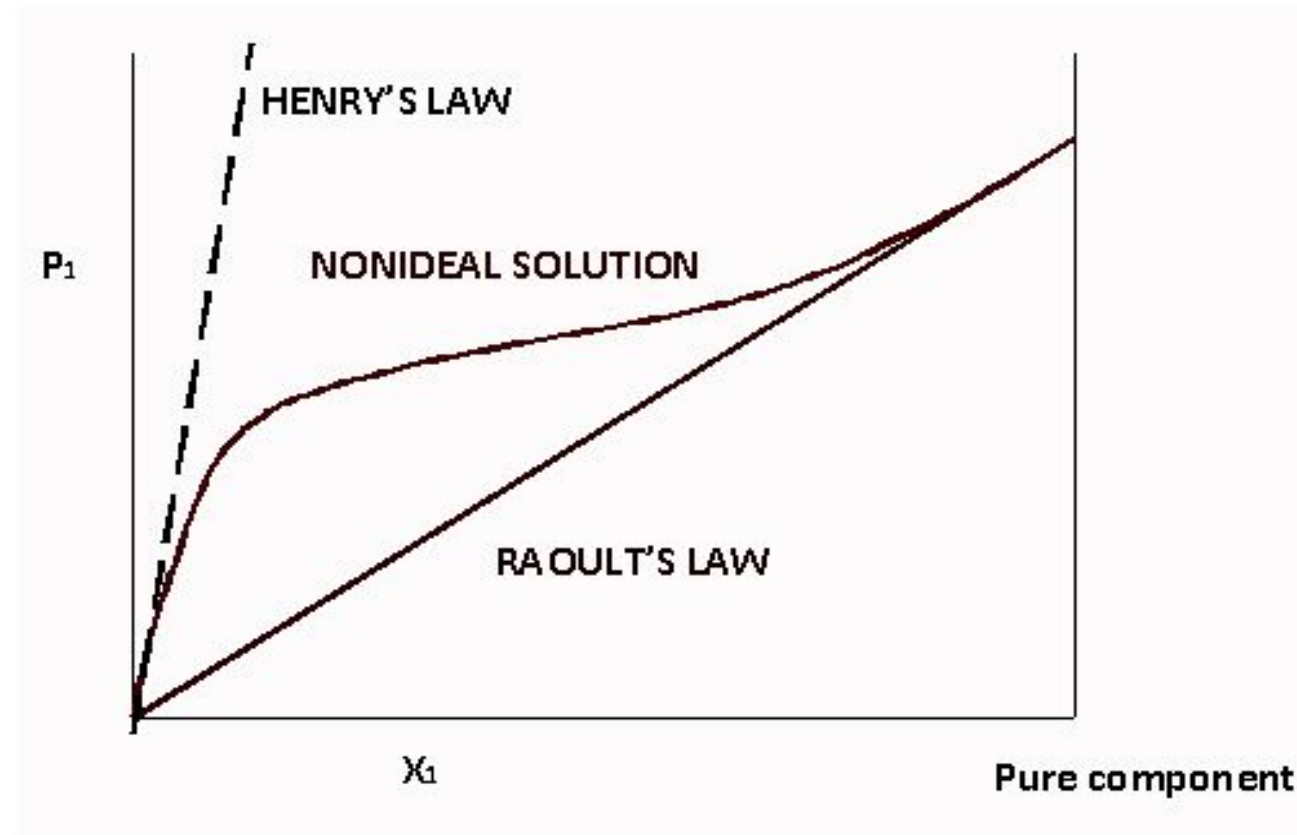


(b) P_{gas} increased

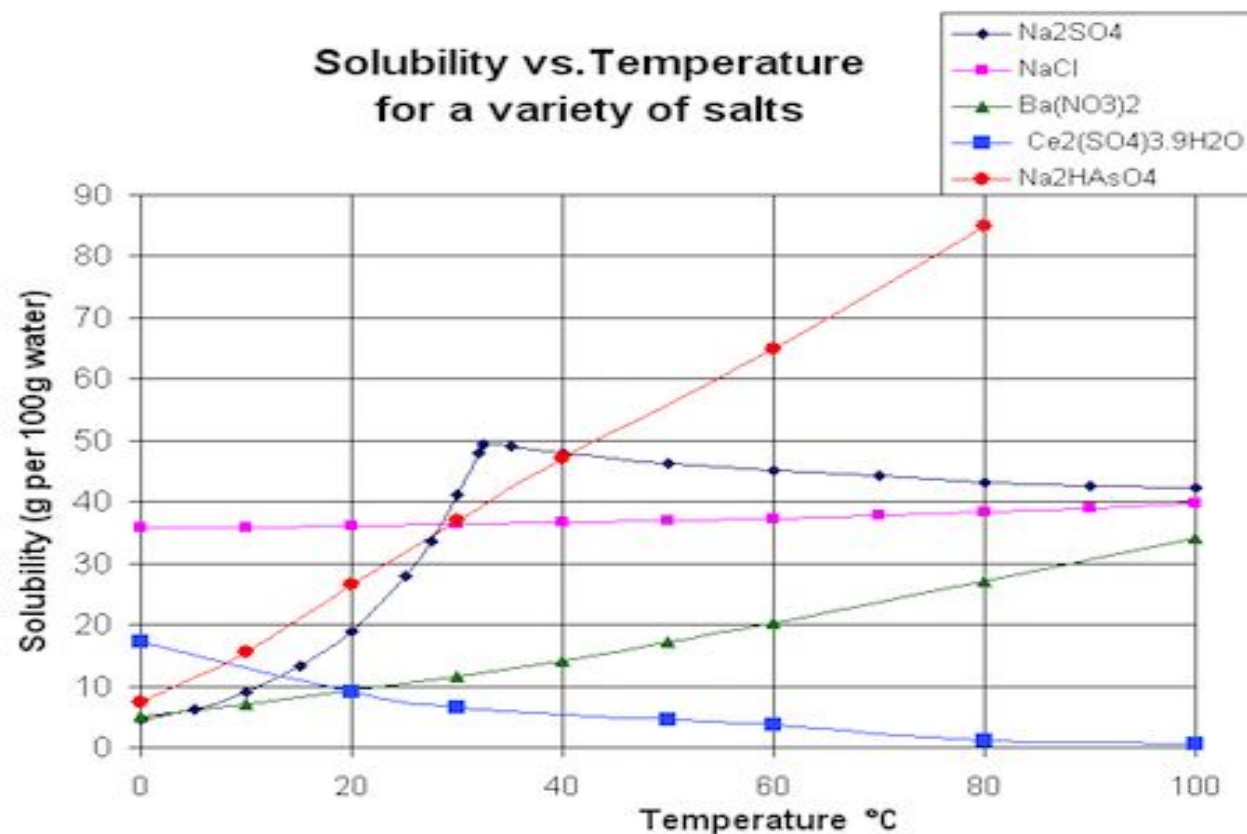


(c) Dynamic equilibrium

Henry's Law

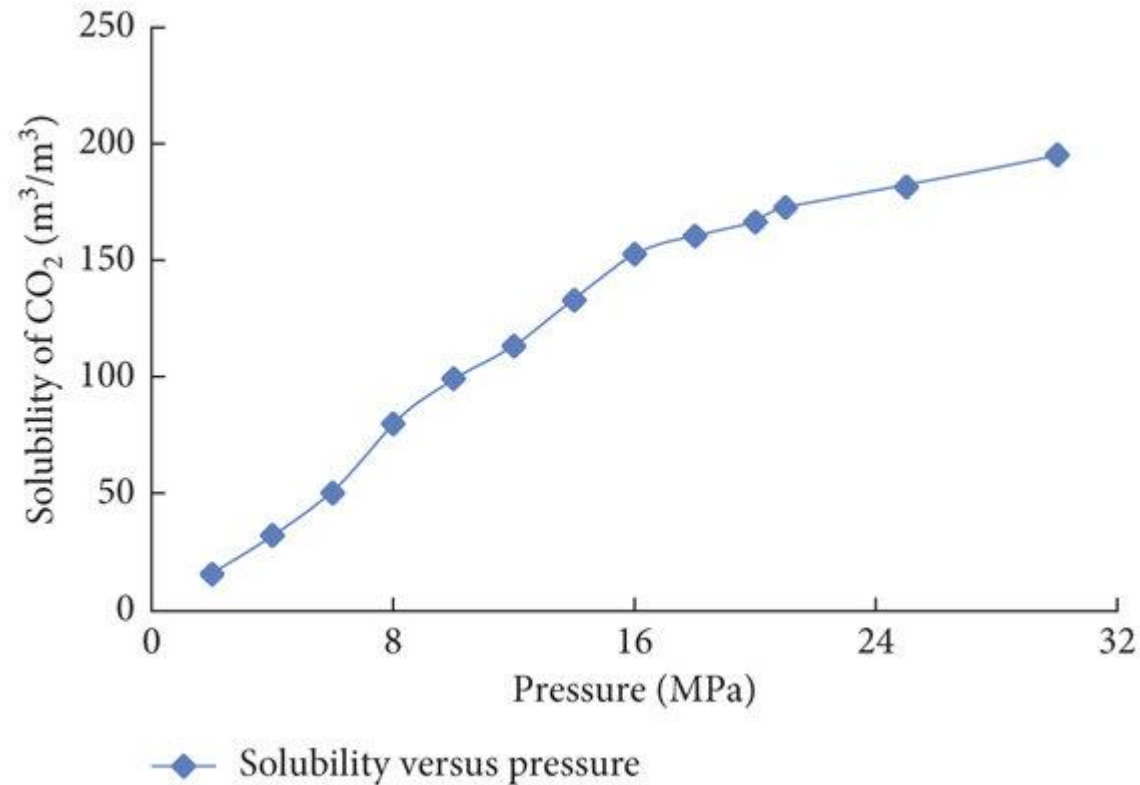


Effect of Temperature on Gas Solubility



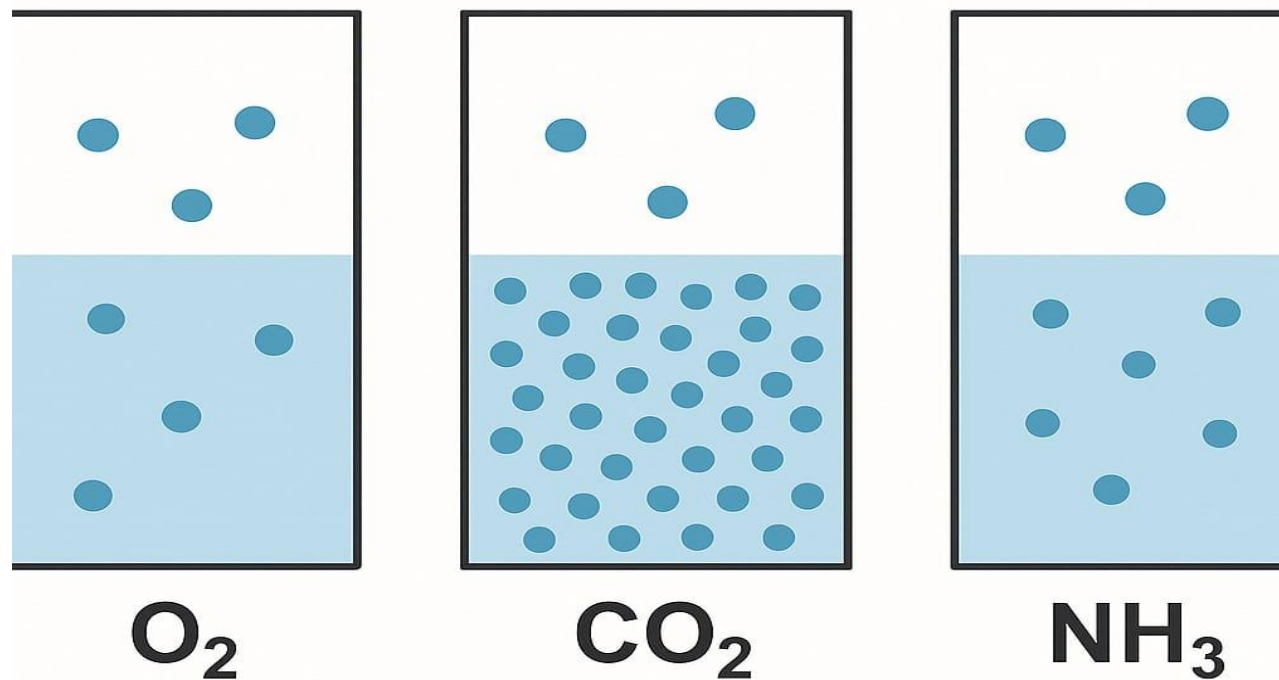
Solubility decreases with rising temperature

Effect of Pressure on Gas Solubility

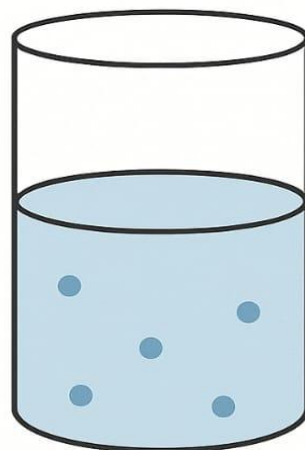


Solubility increases with pressure

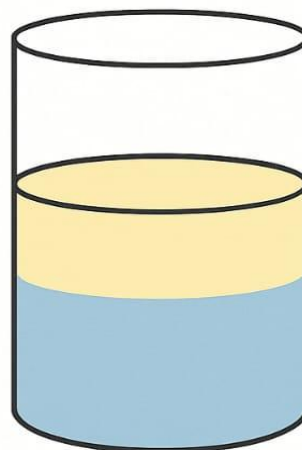
Examples of Gas Solubility



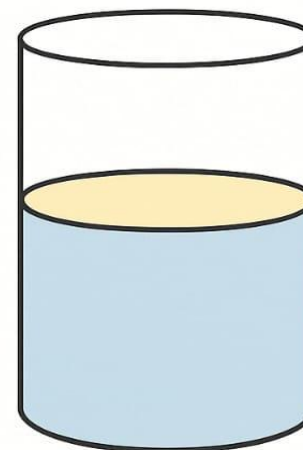
Solubility of Liquids in Liquids



MISCIBLE



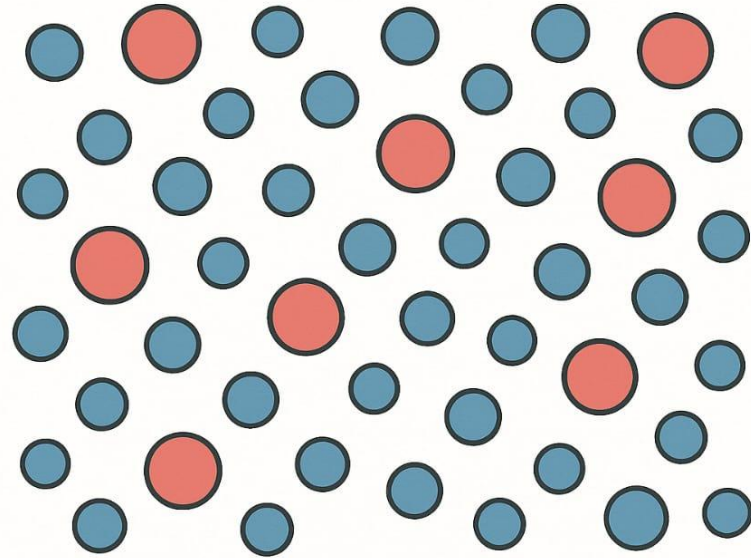
**PARTIALLY
MISCIBLE**



IMMISCIBLE

Liquids can be miscible or immiscible

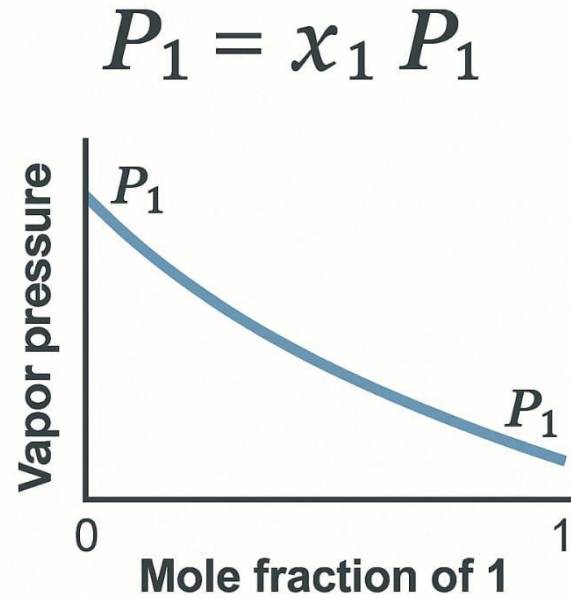
Binary Solutions - Ideal Solutions



IDEAL MIXING

An ideal solution is a mixture that perfectly obeys Raoult's Law, where the intermolecular forces between the solute and solvent are equal to those between the individual components

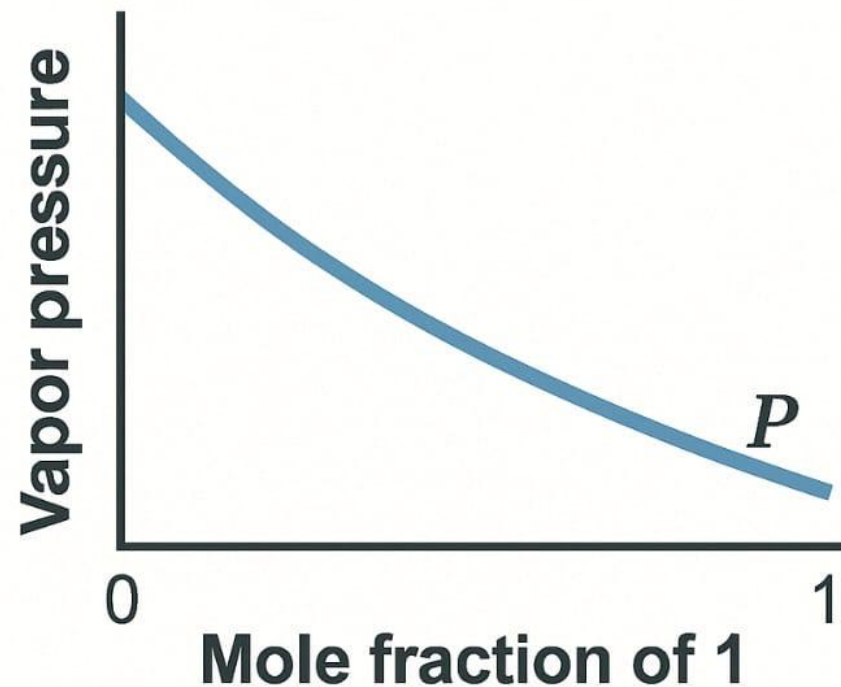
Raoult's Law



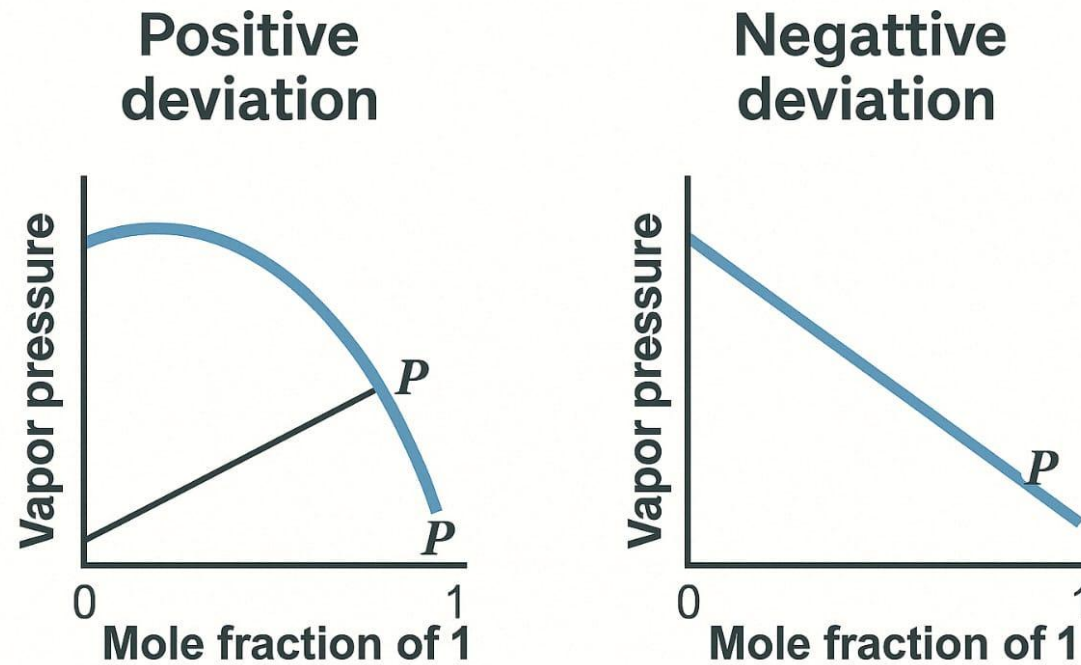
Raoult's law states that the partial vapor pressure of each component in an ideal solution is directly proportional to its mole fraction in the solution.

Vapor Pressure Composition Graph

Raoult's Law Behavior

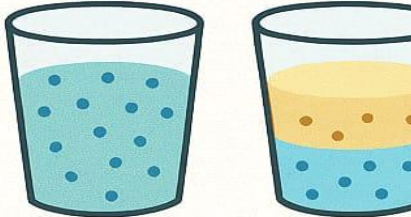
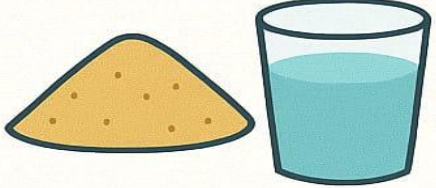


Real Solutions - Deviations from Raoult's Law

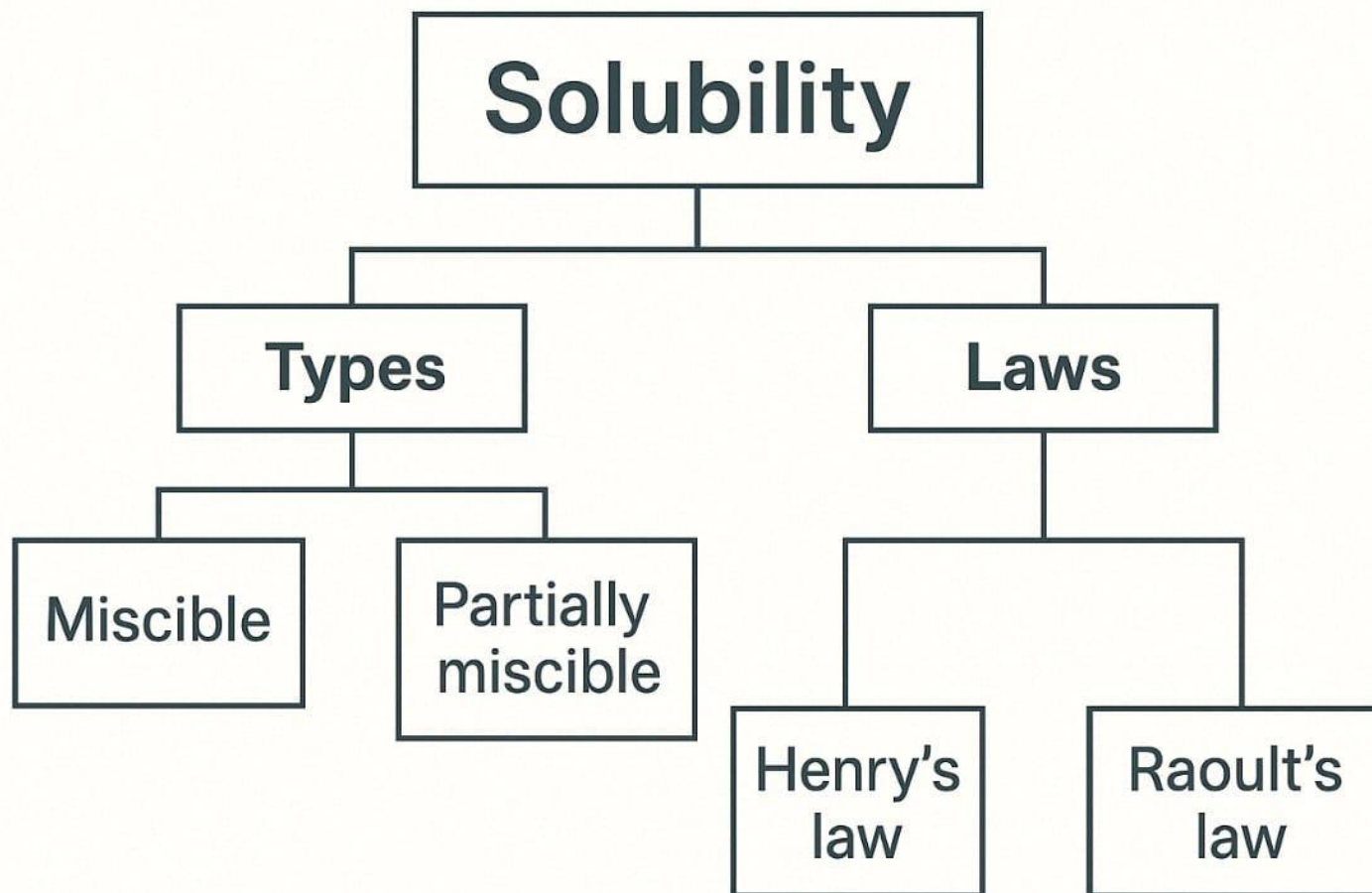


"Real solutions deviate positively or negatively"

Examples of Ideal and Real Solutions

Property	Solution	Mixture
Homogeneous	Yes	
Separable by physical means	No	
Examples	Salt and water	

Flowchart: Types of Solutions and Laws



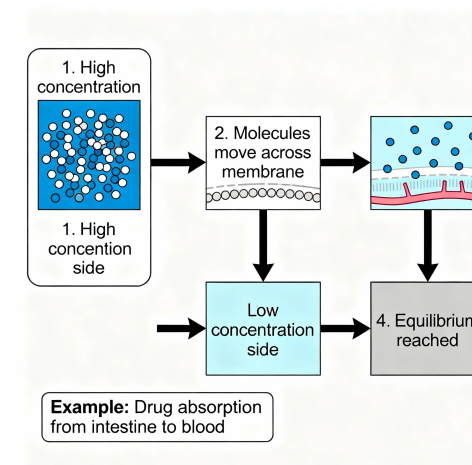
ASSESSMENTS

1.What is the definition of solubility in the context of a solute and solvent?



definition of solubility in the context of a solute and solvent:

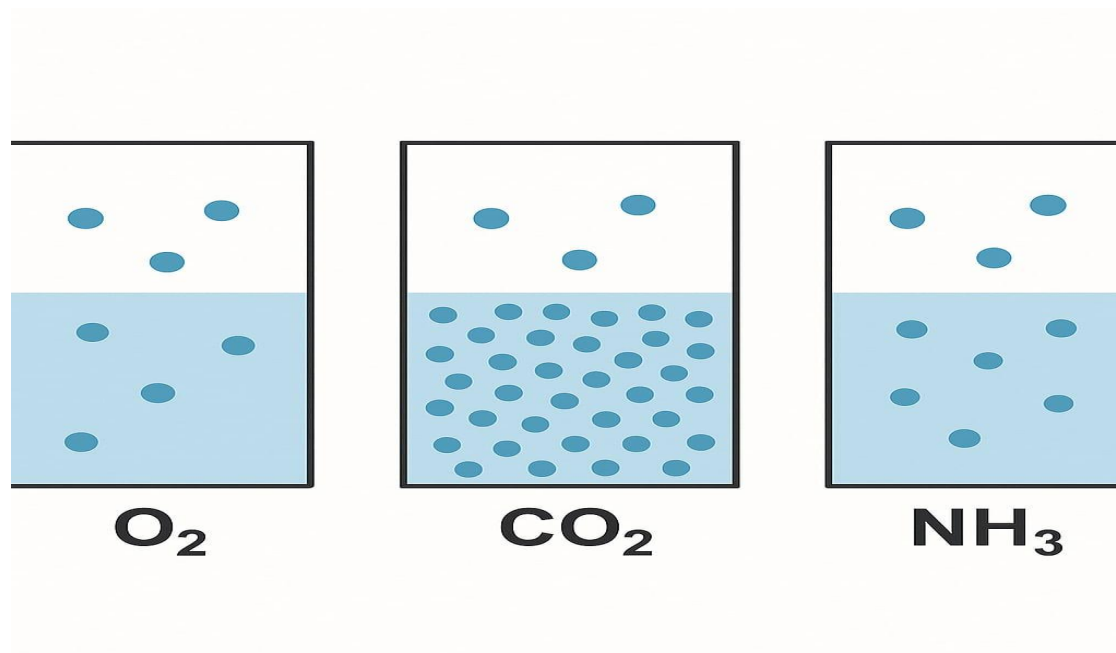
Solubility is the ability of a substance (solute) to dissolve in a solvent to form a homogeneous solution at a specified temperature and pressure.



2. Which factors can affect the solubility of a substance in a solvent?



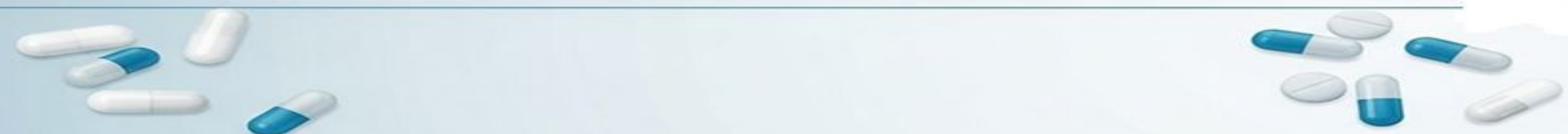
Which factors can affect the solubility of a substance in a solvent?



- Factors affecting solubility include temperature, pressure, and the nature of both the solute and the solvent (such as polarity and intermolecular forces).

REFERENCES

- Physical Pharmaceutics textbooks and lecture notes on solubility and solution chemistry.
- Hansen, C. M. (2007). Hansen Solubility Parameters: A User's Handbook. CRC Press.
- "Solubility and Solute-Solvent Interactions," Slideshare.net, 2023-2024 presentations.
- PharmacyGuideline.com article on "Solubility Expressions and Mechanisms of Solute Solvent Interactions," 2024.



Thank You

