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Concentration terms and Raoult law

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
Molarity	M = n(solute) / V(solution in L) Valid when: volume is that of the whole solution in litres; changes with temperature	mol L^-1
Molality	m = n(solute) / mass of solvent in kg Valid when: mass is that of the solvent only, in kg	mol kg^-1
Mole fraction	x(A) = n(A) / (n(A) + n(B)); sum of x = 1	dimensionless
Mass percent to molarity	M = 10 x w x d / molar mass (w in percent, d in g mL^-1) Valid when: w is mass percent of solute, d is solution density in g per mL	mol L^-1
Raoult law	p(A) = x(A) p*(A) Valid when: ideal solution; p* at the same temperature	same as p*, for example mm Hg or kPa
Two volatile liquids	P = x(A) p*(A) + x(B) p*(B); y(A) = p(A) / P Valid when: ideal solution of two volatile liquids; vapour treated as ideal	mm Hg or kPa; y dimensionless
Non-volatile solute	P = x(solvent) p*; (p* - P) / p* = x(solute) Valid when: non-volatile solute in a dilute or ideal solution	dimensionless ratio
Ideal solution	enthalpy of mixing = 0, volume of mixing = 0	kJ mol^-1 (mL)
Positive deviation	A-B weaker; both mixing terms positive; can show a pressure maximum; minimum-boiling azeotrope	n/a (qualitative)
Negative deviation	A-B stronger; both mixing terms negative; can show a pressure minimum; maximum-boiling azeotrope	n/a (qualitative)

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/chemistry/solutions/concentration-terms-and-raoult-law

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