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osmotic coefficient, ϕ

Quantity characterizing the deviation of the solvent from ideal behaviour referenced to Raoult's law. The osmotic coefficient on a molality basis is defined by:

$$\phi = \frac{\mu_{\mathrm{A}}^{*} - \mu_{\mathrm{A}}}{R\,T\,M_{\mathrm{A}} \sum_i m_i}$$

and on an amount fraction basis by:

$$\phi = \frac{\mu_{\mathrm{A}}^{*} - \mu_{\mathrm{A}}}{R\,T \ln x_{\mathrm{A}}}$$

where μ_{A}^{*} and μ_{A} are the chemical potentials of the solvent as a pure substance and in solution, respectively, M_{A} is its molar mass, x_{A} its amount fraction, R the gas constant and T the temperaure. The latter osmotic coefficient is sometimes called the rational osmotic coefficient.

Source:
Green Book, 2nd ed., p. 51
PAC, 1994, *66*, 533 *(Standard quantities in chemical thermodynamics. Fugacities, activities and equilibrium constants for pure and mixed phases (IUPAC Recommendations 1994))* on page 546

