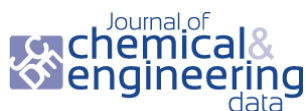


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Conductivity of Silver Nitrate in Nonaqueous and Mixed Solvents.

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and this is yet more pronounced in the behavior of W_{12} .

SUMMARY OF RESULTS IN THE TWENTY-ONE MIXED SOLVENT SYSTEMS

There are three major aspects to this series of studies:
Use of Equations 12 or 13 in Predicting Interaction. In the 10 systems for which literature values of solvent-solvent interaction are available, the average error in the prediction of solubility by either equation is 0.002 mole fraction naphthalene. In a given system, component dissimilarity is reflected in the size of the error.

Use of Equations 15 or 16 in Approximating Interaction. Treatment of a ternary system as a pseudo-binary with Equation 16 is often a useful approach. The approximation that 1-3 component interaction may be related to that of 1-2 and 2-3 by Equation 15 is similarly available. The use of these equations appears to be most valid for the aromatic pairs. Fair agreement is found for the nonaromatic pairs, while for aromatic-nonaromatic pairs, there is frequently considerable error. The assumption is generally poorest for systems involving hexadecane.

Determination of Binary Interchange Energy by Measurements in a Ternary System. In some of the systems, agreement between experimental and literature values of solvent-solvent interchange energy is quite good. Thus, the determination of that quantity by solubility measurements in solvent-solvent mixtures is a suitable method in systems behaving regularly and with pairwise interaction.

ACKNOWLEDGMENT

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NOMENCLATURE

ΔG^E	= molar excess Gibbs free energy of mixing
$\Delta \bar{G}_2^E$	= solute partial molar excess Gibbs free energy of mixing
$\Delta \bar{G}_2^{E, \text{binary}, x}$	= $\Delta \bar{G}_2^E$ calculated with Equation 12
$\Delta \bar{G}_2^{E, \text{binary}, \phi}$	= $\Delta \bar{G}_2^E$ calculated with Equation 13
V_2	= molar volume
W	= interchange energy, cal. mole ⁻¹
W'	= interchange energy, cal. ml. ⁻¹
x	= mole fraction
x^o	= mole fraction, solute-free basis
δ	= solubility parameter
γ	= activity coefficient
ϕ	= volume fraction
ϕ^o	= volume fraction, solute-free basis

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Conductivity of Silver Nitrate in Nonaqueous and Mixed Solvents

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Measurements of the conductivity of silver nitrate in methanol and binary mixtures of methanol containing 0.1 mole % of nitromethane, pyridine, and benzene at 30° C. are reported and discussed.

SOLVENT-ION EFFECTS have been observed in previous conductivity work (1) at 25° C. with silver nitrate in methanol containing an electron-donating additive, present in an amount (0.1 mole %) sufficient to interact appreciably with the cation but not to alter the viscosity and dielectric constant of the main solvent effectively.

The conductivity of silver nitrate in methanol and binary solvent mixtures was measured at 30° C. Each mixture contained 99.9 mole % methanol and 0.1 mole % of one of the additives used previously (1), namely, pyridine, nitromethane, and benzene. This provided thermodynamic data to extend knowledge on solvent-ion interaction.



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