

Solvent effect on the heat of solution and partial molar volume of some non-electrolytes and lithium perchlorate

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Abstract

For several non-electrolytes and for lithium perchlorate the solvent effect on the heat of solution and partial molar volumes was studied. In the absence of the donor-acceptor and electrostatic interactions, clear proportionality can be seen only in the alkane solutions and these changes are defined by the non-alkane component. For solutions of π -acceptor (tetracyanoethylene) and ν -acceptor (gallium chloride) in the presence of π,π -, π,ν - and ν,ν -complexes, the relation between the changes of interaction energy and the values of the partial molar volumes can be seen. The maximum change in the value of partial molar volumes (up to 50 cm³ mol⁻¹) was noted for lithium perchlorate in ten solvents. The volume change is proportional to the compressibility coefficients of the solvents and correlates less with the values of heat of solution and solvent permittivity. Copyright © 2006 John Wiley & Sons, Ltd.

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Keywords

Electrolytes, Electrostriction, Non-electrolytes, Partial molar volume, Solution enthalpy