

Isobutane as a probe of the structure of 1alkyl3methylimidazolium bis(trifluoromethylsulfonyl)imide ionic liquids

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©2015 Elsevier Ltd. All rights reserved. An experimental study of the solubility and of the thermodynamic properties of solvation, between temperatures (303 and 343) K and at pressures close to atmospheric, of 2methylpropane (isobutane) in several ionic liquids based on the bis(trifluoromethylsulfonyl)imide anion and on 1alkyl3methylimidazolium cations, $[C_nC_1Im][NTf_2]$, with alkyl sidechains varying from two to ten carbon atoms is presented. The isobutane solubility increases with increasing size of the alkyl sidechain of the cation in the ionic liquid and decreases with increasing temperature (as typical of an exothermal dissolution process). The mole fraction solubility of isobutane varies from $0.904 \cdot 10^{-2}$ in $[C_2C_1Im][NTf_2]$ at $T = 343$ K to $1.002 \cdot 10^{-1}$ in $[C_{10}C_1Im][NTf_2]$ at $T = 303$ K. The values measured in this work are compared to the behaviour of nbutane in the sa