

Imidazolium Based Ionic Liquids: Impact of the Cation Symmetry and Alkyl Chain Length on the Enthalpy of Vaporization

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Abstract

© 2017 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim The vaporization thermodynamics of symmetric imidazolium based ionic liquids of the general formula $[C_n C_n Im][Br]$ with the chains length $n = 4, 5, 6,$ and 8 were investigated using a combination of DSC, TGA, and QCM methods with quantum chemical calculations. Comparison of vaporization enthalpies for the symmetric ($[C_n C_n Im][Br]$) and asymmetric imidazolium based ILs ($[C_n mim][Br]$) revealed a general trend with the lower vaporization enthalpies of the symmetric species indicating a significant decrease of the Coulombic interactions affecting energetics of vaporization.

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Keywords

Ionic liquids; Enthalpy of vaporization; Thermogravimetry; Quartz-crystal microbalance; Quantum chemical calculations

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