

# Thermochemical Properties of Tunable Aryl Alkyl Ionic Liquids (TAAILs) based on Phenyl-1H-imidazoles

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## Abstract

© 2017 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim Vaporization enthalpies of five different imidazolium based Tunable Aryl Alkyl Ionic Liquids (TAAILs) with a common bis(trifluoromethylsulfonyl)imide ([NTf<sub>2</sub>]<sup>-</sup>) anion were measured using a Quartz Crystalline Microbalance (QCM) and by Thermogravimetric Analysis (TGA). The counter anion and the alkyl chain of these imidazolium-based ionic liquids with one N-aryl and one N-alkyl substituent were kept constant to study the influence of the ortho- and para-substituted aryl moieties on the vaporization enthalpies of these ionic liquids. For comparison, enthalpies of vaporization measured at elevated temperatures were adjusted to the reference temperature 298 K. Structure-property relations between TAAILs and similarly shaped corresponding 1-(R-phenyl)-imidazoles were analyzed. An incremental approach to predict vaporization enthalpies of ionic liquids by group contributions was suggested. The procedure is based on vaporization enthalpy of a starting IL and group contributions well established from molecular compounds.

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## Keywords

Ionic liquids; Enthalpy of vaporization; Quartz crystal microbalance; Structure-property relations

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