Research paper

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The evaporation study of silicon-containing ionic liquid

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ABSTRACT

1,2-dimethyl-3-(1´,1´,3´,3´-tetramethyl-3´-phenyldisiloxanyl)methylimidazolium bis(trifluoromethanesulfonyl)amide ($[PhC_5OSi_2MMIm^+][Tf_2N^-]$) is the first silicon-containing ionic liquid which was characterized with the vaporization enthalpy, (138.5±1.8) $kJ{\cdot}mol^{-1}$, and saturated vapor pressure, $\ln(p/Pa) = -(16656\pm219)/(T/K)+(30.69\pm0.92)$. This compound is an unique ionic liquid giving ions, retaining both cationic and anionic portions, in the electron impact ionization (EI) mass spectrum.

Keywords: ionic liquid, vaporization enthalpy, vapor pressure, mass spectrum, Knudsen cell, ions, fragments

Supplementary Information (SI) attached (see Supl1.docx)

INTRODUCTION

Ionic liquids ($[Cat^+][An^-]$) demonstrate great potential for practical use as materials for ion generation in various ionic techniques, non-volatile heat-transfer agents, ionic solvents in electrochemistry, surfactants, lubricants, reagents and catalysts in chemical synthesis. Ionic liquids with an organosilicon substituent are expected to possess unique physical properties beneficial for their applications. By a present moment the density, viscosity, conductivity and glass transition temperatures have been measured for some of them.[1−3] The introduction of a

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