

Accepted Manuscript

Ionization Dynamics in Ionic liquids Probed via Self-Diffusion Coefficient Measurements

Youngang Mao, Krishnan Damodaran

PII: S0301-0104(14)00186-4

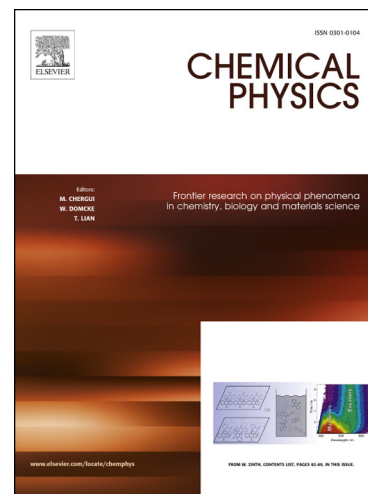
DOI: <http://dx.doi.org/10.1016/j.chemphys.2014.06.014>

Reference: CHEMPH 9130

To appear in: *Chemical Physics*

Received Date: 14 April 2014

Accepted Date: 21 June 2014



Please cite this article as: Y. Mao, K. Damodaran, Ionization Dynamics in Ionic liquids Probed via Self-Diffusion Coefficient Measurements, *Chemical Physics* (2014), doi: <http://dx.doi.org/10.1016/j.chemphys.2014.06.014>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Ionization Dynamics in Ionic liquids

Probed via Self-Diffusion Coefficient Measurements

*Yougang Mao and Krishnan Damodaran**

National Energy Technology Laboratory, Pittsburgh, PA 15236

Department of Chemistry, University of Pittsburgh, Pittsburgh PA 15260

Corresponding Author

*damodak@pitt.edu

Abstract

Ionic liquids contain ions and ion pairs with fast exchange between them. We propose a novel process to deduce the fraction of ions present in an ionic liquid and the equilibrium constants of ionization processes from measured ion self-diffusion coefficients using Pulsed Field Gradient (PFG) NMR. The enthalpy and entropy changes of ionization and ion self-diffusion processes are obtained for a series of ionic liquids using this method. These data were used to explain the interactions between cations and anions of ionic liquids. The interactions are also interpreted by the delocalization of the ion's charge densities. The self-diffusion coefficients of cations and anions for measured ionic liquids are discussed.

Key words: Ionicity, ion concentration, thermodynamics, non- Arrhenius behavior

Download English Version:

<https://daneshyari.com/en/article/5373422>

Download Persian Version:

<https://daneshyari.com/article/5373422>

[Daneshyari.com](https://daneshyari.com)