

## Accepted Manuscript

Surface structures of binary mixture of ionic liquids

Kaoru Nakajima, Shunto Nakanishi, Martin Lísal, Kenji Kimura

PII: S0167-7322(16)33647-9  
DOI: doi: [10.1016/j.molliq.2017.01.073](https://doi.org/10.1016/j.molliq.2017.01.073)  
Reference: MOLLIQ 6875

To appear in: *Journal of Molecular Liquids*

Received date: 24 November 2016

Accepted date: 21 January 2017

Please cite this article as: Kaoru Nakajima, Shunto Nakanishi, Martin Lísal, Kenji Kimura, Surface structures of binary mixture of ionic liquids. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi: [10.1016/j.molliq.2017.01.073](https://doi.org/10.1016/j.molliq.2017.01.073)

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.



**Surface structures of binary mixture of ionic liquids**

Kaoru Nakajima<sup>1</sup>, Shunto Nakanishi<sup>1</sup>, Martin Lísal<sup>2,3</sup>, and Kenji Kimura<sup>1\*</sup>

<sup>1</sup>*Department of Micro Engineering, Kyoto University, Kyoto-daigaku-katsura, Nishikyo,  
Kyoto 615-8540, Japan*

<sup>2</sup>*Laboratory of Aerosols Chemistry and Physics, Institute of Chemical Process Fundamentals  
of the CAS, v. v. i., 165 02 Prague 6-Suchdol, Czech Republic*

<sup>3</sup>*Department of Physics, Faculty of Science, J. E. Purkinje University, 400 96 Ústí n. Lab.,  
Czech Republic*

Surfaces of 11 equimolar mixtures of ionic liquids (ILs) consisting of 1-alkyl-3-methylimidazolium cations (from [C<sub>2</sub>C<sub>1</sub>Im] to [C<sub>12</sub>C<sub>1</sub>Im]) with anions (Cl, [BF<sub>4</sub>], [TfO], [PF<sub>6</sub>], [Tf<sub>2</sub>N]) were observed using high-resolution Rutherford backscattering spectroscopy (HRBS). The elemental depth profiles of these IL mixtures were derived from the observed HRBS spectra through spectrum modeling. By comparing the observed depth profiles with those of pure ILs, the surface mole fractions of constituent ILs were estimated. We found a general tendency that larger IL is enriched at the surface. The observed surface enrichment can be reasonably well reproduced by a simple thermodynamic calculation based on the Sprow-Prusnitz equation. A slight deviation from the calculated result was ascribed to the nonideal behavior of the IL mixtures, which was neglected in the calculation.

Keywords: ionic liquids; mixture; surface structure; high-resolution Rutherford backscattering spectroscopy

---

\* Address correspondence to this author (E-mail: kimura@kues.kyoto-u.ac.jp)

Download English Version:

<https://daneshyari.com/en/article/5408895>

Download Persian Version:

<https://daneshyari.com/article/5408895>

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