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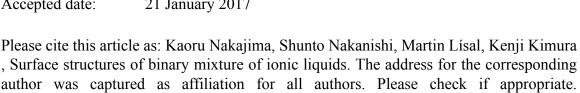
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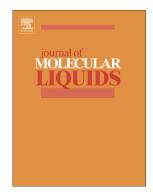
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ACCEPTED MANUSCRIPT

Surface structures of binary mixture of ionic liquids

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of ionic Surfaces 11 equimolar mixtures liquids (ILs) consisting 1-alkyl-3-methylimidazolium cations (from $[C_2C_1Im]$ to $[C_{12}C_1Im]$) with anions (Cl, $[BF_4]$, [TfO], [PF₆], [Tf₂N]) 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-Prausnitz 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

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