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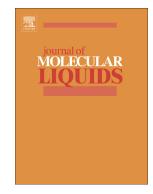
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PII: DOI: Reference:	S0167-7322(17)33137-9 doi:10.1016/j.molliq.2017.09.087 MOLLIQ 7924
To appear in:	Journal of Molecular Liquids
Received date: Revised date: Accepted date:	<ol> <li>13 July 2017</li> <li>8 September 2017</li> <li>20 September 2017</li> </ol>

Please cite this article as: Marina V. Fedotova, Sergey E. Kruchinin, Gennady N. Chuev, Local ion hydration structure in aqueous imidazolium-based ionic liquids: The effects of concentration and anion nature. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2017.09.087

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## ACCEPTED MANUSCRIPT

## Local Ion Hydration Structure in Aqueous Imidazolium-Based Ionic Liquids: The Effects of Concentration and Anion Nature

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The effects of concentration and anion nature on the ion hydration structure in aqueous imidazolium-based ionic liquids (IL), [EMIM][EtSO<sub>4</sub>], [EMIM][Cl], and [EMIM][Gly], were studied using integral equation theory in the one- and three-Dimensional Reference Interaction Site Model (1D- and 3D-RISM) approaches. The concentration behavior of ion hydration has been examined for the [EMIM][EtSO<sub>4</sub>]-water mixture. It was found that the main concentration effect is in significant dehydration of both the cation and the anion with increasing IL content from 0.005 M to 4.714 M. At the same time, at low IL content all ions under study are well hydrated with stronger interactions between the anions and water in comparison with the cation and water. The obtained data indicate strengthening of anion-water interactions in the sequence  $[EtSO_4]^- < [Gly]^- < [Cl]^-$ .

Key words: ionic liquid; aqueous solution; ion; hydration structure

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