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**Solute-Solvent Interaction in Systems of Ionic Liquids with Molecular Solvents.**

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# Solute-Solvent Interaction in Systems of Ionic Liquids with Molecular Solvents

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Ionic liquids (ILs) are molten salts consisting of large, asymmetric organic cations and organic or inorganic anions with a melting point below 100 °C. Numerous combinations of different anions with structurally modified cations can affect their physical and chemical properties. Increasing attention has been paid to room-temperature ionic liquids (RTILs) and their applications as green solvents, since many of them are non-volatile, biodegradable and recyclable materials.<sup>1</sup>

In this study, thermodynamic properties of hydrophilic 1-alkyl-3-methylimidazolium-based ILs ( $n = 4,6,8,10$ ) with a saccharinate (Sac) anion have been investigated. The goal of this study was to understand the interactions of ions and their interaction with molecular solvents such as water, methanol, acetone, etc. Saccharinate is a natural nontoxic anion, contributing to a relatively high viscosity of the ionic liquid. Application of highly viscous ILs can be difficult and can be overcome by mixing with some molecular solvents.

The present ILs were used in a previous study for a laboratory-scale extraction of glaucine from its plant.<sup>2</sup> S-(+)-Glaucine is the main alkaloid component in the *G. flavum* with a wide variety of pharmacological effects including antitussive, contraceptive, anticonvulsant, and neuroleptic-like activities. To design an industrial-scale extraction, it is important to have a good knowledge of the physico-chemical properties in the relevant mixtures of ILs with molecular solvents.

1-Butyl-3-methylimidazolium saccharinate [Bmim][Sac] and 1-Hexyl-3-methylimidazolium saccharinate [Hmim][Sac] were synthesised in this work, whereas 1-octyl-3-methylimidazolium saccharinate and 1-decyl-3-methylimidazolium saccharinate were provided by the group of Prof. Bogdanov.<sup>3</sup>

So far, density and electrical conductivity were measured in this work for a basic characterization of the studied ionic liquids. Later, volumetric properties and liquid-liquid equilibria in systems of ILs with water and glaucine will be investigated in view of a study of structure-property relationships in these binary and ternary systems, but also from the point of view of the extraction of glaucine.

References

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3. Tonova, K.; Svinyarov, I.; Bogdanov, M. Hydrophobic 3-alkyl-1-methylimidazolium saccharinates as extractants. *Sep. Pur. Tech.* **2014**, *125*, 239–246.