

**AGGREGATION BEHAVIOR OF AQUEOUS SOLUTIONS OF
ALKYLIMIDAZOLIUM AMINO ACID IONIC LIQUIDS:
EFFECTS OF "NATURAL" ADDITIVES**

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The demand for greener chemistry that implies sustainability via renewable, biodegradable and eco-friendly chemicals is rapidly growing. Of particular interest are formulations of aggregates in bio-derived solvents because such systems may provide reaction media with enhanced reaction rates, solubilization capacity, and a potential for the aggregate-mediated separation of the products. Micellar solutions and microemulsions, among others, have been widely used in micellar catalysis, nanoreactor engineering, controllable drug release and micelle-mediated separation. Recently, a number of bio-derived solvents have emerged, including natural deep eutectic solvents (NADES) and renewable solvents derived from biomass. The surface-active ionic liquids, particularly, the amino acid ionic liquids (AAILs), are of a high potential as bio-based surfactants [1]. It is well known that the aggregation behavior of surfactants in mixed solvents depends substantially on the specific chemistry of the constituent substances.

In this work, we study aggregation behavior of 1-dodecyl-3-methylimidazolium AAILs in aqueous-salt solutions. Sodium chloride, choline chloride and choline chloride+L-proline (components of NADES) were chosen as modulators of micellar aggregation. The aggregation characteristics, including critical micelle concentration (CMC), surface tension and aggregate size are determined using tensiometry, photon correlation spectroscopy, and conductometry techniques. Structural characteristics of the aggregates are also examined by molecular dynamics simulation. Our study combines experiment and computer simulation with development and application of a molecular thermodynamic aggregation model that takes into account both the coulombic and the specific interactions in the aggregating fluid.

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