

DEVELOPING NEW IONIC LIQUID FORMULATIONS FOR ENERGY APPLICATIONS

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Abstract:

Ionic liquids have thermal and physical characteristics which make them attractive media for use in heat transfer and short heat term storage systems. The heat capacity, and thus potential thermal energy storage capability, of many ionic liquids surpass those of commercial hot-oil and synthetic heat transfer fluids suggesting there is a role for ionic liquids as novel thermal fluids.

However, if ionic liquid based materials are to be used in such generic, bulk applications, rather than as speciality materials, then there is a need to design and manufacture ionic liquids within the constraints of a very tight price/performance/environmental impact matrix. Thus, efficient, cheap, and reproducible approaches to prepare ionic liquids with well-defined properties and high purity are therefore required.

We have studied over a number of years a number of methodologies including the use of alcohols [1], alkyl-sulfates [2], epoxides [3] and carbonates [4] as alkylating agents and 'cleaner' anion transformations, via hydroxides [5] in order to prepared diverse libraries of ionic liquids. Here, these approaches and their use to enable the manufacture of ionic liquid systems in which performance is matched with simplicity of production and cost will be reviewed.

References:

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