

"Ionic Liquids in the service of fuel cells >100°C, protein folding studies, and biopreservation.

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Liquids composed only of ions, famously important in the history of chemistry (Humphrey Davy and the elements), are usually only found at high temperatures due to the strength of the Coulomb interaction. However by use of asymmetric anions and large organic cations it has been possible to lower melting points of pure salts to below room temperature. When stabilized by multicomponent mixing, "ionic liquids" can become almost uncrystallizable, and can be used for many novel purposes. Here we explore their usefulness for fundamental glassformer studies, medium temperature fuel cell electrolytes (where we find inorganic versions of these liquids of special utility), and biophysical studies where we find they make solvents with extraordinary stabilization/preservation potential for biomolecules. Their application in protein unfold/refold studies is of particular interest.