Ionic Liquids for Colloids and Materials for Sustainable Development Goals

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Ionic liquids (ILs) are the materials comprised only of ions and are liquid at temperatures at least below 100 ^{o}C contrary to the conventional ionic materials which exhibit a very high melting point, for example, melting point of NaCl ~ 800 ^{o}C. The first reported IL dates back to 1911 when Sir. P. C. Ray has reported ethyl ammonium nitrite,[1] however most of the literature cites the first IL to be ethyl ammonium nitrate reported by Paul Walden in 1914. The work on the use of ILs for diverse applications, thanks to their unique and tailorable physio-chemical properties, has progressed at vast speed during last 25 years.[2] During this talk, the basic properties of ILs, their tailormade nature and diverse applications will be discussed. Following that the self-assembling behavior of Surface-Active Ionic Liquids (SAILs),[3a] which shows surface active properties better than many of the conventional ionic surfactants and their utility to create diverse colloids in conjunction with biopolymers will be discussed.[3b] At last, the usefulness of SAILs for preparing variety of photo-catalytically active nano-materials[3c] along with utility of novel neoteric deep eutectic solvents towards sustainable developmental goals will be highlighted.[3d]

1. P. C. Ray and J. N. Rakshit, Nitrites of the alkylammonium bases: Ethylammonium nitrite, dimethylammonium nitrite and trimethylammonium nitrite, *J Chem. Soc., Trans*., Vol.99, p.1470, 1911.
2. T. Welton *Chem. Rev*.1999, 99, 2071.
3. (a) T. S. Kang *et. al., Chem Commun*, 2018, 54, 2432; (b) *Chem. Rev.* 2024, 124, 6, 3037; (c) *J. Material. Chem. A. 2019, 7, 5185; (d) Green Chemistry* 2022, 24, 2953.