

Ionic Liquids as Potential Green Solvents Their Interactions with Surfactants and Antidepressant Drugs

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Abstract

As potential alternative solvents to volatile organic solvents, ionic liquids (IL) are highly desirable green solvents owing to their noncorrosive nature, negligible volatility, applications in lubrication, in electrochemistry, in synthesis, in separation processes, and overall environmentally friendly green solvents. The capability of ILs in dissolving many compounds like organometallic, organic, and inorganic compounds with large polarity makes the ILs as efficient green solvents. Moreover, the bulky ions in ILs are loosely packed, do not evaporate easily because of having low vapour pressure and are stable thermally up to 300 °C. The wide liquid range, as high as 200 °C enables ILs to have kinetic control over wide range. They possess good thermal conductivity and are immiscible in organic solvents. One of the forms of ILs called surface active ionic liquids (SAILs) owing to their amphiphilic nature are also emerging as novel surfactants. For example, SAIL-amphiphilic antidepressant drug interactions has been a subject of interest as any variation either in the chain length of hydrocarbon part or the presence of any substituent on the hydrophobic core may cause changes in their behaviour, thus modifying their pharmacological activity and chemical stability. One of the uses of SAILs as solubilizing agents to solubilize solubilizates such as drugs or other biomolecules which are poorly soluble in aqueous media is another recent area being given due importance. This chapter will give an insight into various interactions, uses, and solubilization of drugs particularly antidepressant drugs by ILs. Furthermore, as green solvents their use in industrial chemical processes directly result in economic, social, and ecological impact on the human well-being and environment.