Ionic liquids in biological processes: utilization, optimal design and recovery

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The potential of ionic liquids as green alternative to environmentally harmful volatile organic solvents in biological processes has been investigated during the last decades. Novel uses of ionic liquids come from unique and advantageous properties of ILs, including negligible vapor pressure, nonflammability, wide liquid range, high thermal and chemical stabilities, and the ability to dissolve a wide range of inorganic, organic, and polymeric materials. In this study, the uses of ionic liquids as (i) solvents for enzymatic reactions, biomass dissolution and (ii) additives for protein refolding will be elaborated either by experiment and molecular dynamic simulation. The optimal design of ionic liquids with desired properties/activities suitable for specific applications using computer-aided molecular design approach and methods for recovery of ionic liquids are also discussed.