

**Task-Specific Ionic Liquids in Microemulsions:
A New Frontier for Oxidation Chemistry**

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Microemulsions are excellent solvents for hydrophobic organic compounds and are useful as reaction media to overcome the reagent incompatibility frequently encountered in chemical decontamination. Recent work incorporating ionic liquids (ILs) in microemulsions leads to very high reactivity in these hybrid ionic liquids-microemulsions. It has been demonstrated that an extra acceleration of a reaction may be obtained by proper choices of surfactant and ILs in the formulation. All three aspects of the use of microemulsions as medium for chemical reactivity, i.e. overcoming reagent incompatibility, providing specific rate enhancement (microemulsion catalysis) and inducing regiospecificity, are augmented. Reactions in these hybrid systems show the importance of both the large oil-water interface and the high dynamics of the system. Water was added to the formulation and it was found that the reaction rate changed abruptly when the system passed from water-in-oil to bicontinuous and again when the bicontinuous microemulsion was transformed into an oil-in-water microemulsion, opening new pathways to product recovery.