

P010 Biocatalysis in Novel Functionalised Ionic Liquids
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Ionic liquids are salts with melting points below room temperature. They have been the subject of considerable interest for many years due to their unique combination of physical properties. These render them desirable solvents for a number of processes, including enzyme-catalysed biotransformations of organic compounds. Ionic liquids offer the capability of dissolving higher concentrations of most organic substrates than are achievable in water, whilst being generally more compatible with biomolecular structures than conventional molecular organic solvents.

We have shown that rational functionalisation of ionic liquids can improve their performance as biocatalytic media; furthermore, we have recently developed a range of novel ionic liquids which offer significant improvements over imidazolium salts and their analogues. This project aims to address their application as alternative media for biocatalysis using purified enzymes, focusing on hydrolases. Since the degree of protein solubility and other fundamental aspects of enzyme/solvent interactions in these media are so far poorly understood, a comparative study of activity and conformation through complementary techniques will clarify these aspects and identify the parameters directing the choice of the best ionic liquid for a given biocatalytic reaction. The model systems will moreover help to acquire an in-depth understanding of the potential utility of ionic liquids in biocatalysis and to consider more applied aspects relating to specific, industrially relevant enzyme-catalysed processes.