

Hydrolase-catalyzed hydrolysis of styrene oxide in ionic liquids

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The commercial free soluble epoxide hydrolase from *Aspergillus niger* sp. (recombinant from *Aspergillus niger*) (AnEH) was employed for enantioselectivity hydrolysis of racemic styrene oxide leading to the unreacted epoxide and the corresponding 1-phenyl-1,2-ethanediol both in optically pure form. Although water is one of the most commonly proposed green solvent in biotransformation, using enzyme in aqueous media have several obstacles such as enzyme stability and hydrophobic substrate solubility. Ionic liquids (ILs) was therefore investigated as media to enhance both conversion and enantioselectivity of hydrolysis reaction. Microemulsion environment (1-hexyl-3-methylimidazolium bis[(trifluoromethylsulfonyl)imide] [Hmim][Tf2N] and 50mM Tris-HCl buffer (pH=7.5) (9:1, v/v)) showed initial activity of AnEH that was about 1.35 times higher than that in buffer. Conversion of 64% and 89.3% component of (R)-diol in products which was obtained from hydrolysis of 5mM substrate racemic styrene oxide in microemulsion media of [Hmim][Tf2N] and buffer (9:1, v/v). Since the high initial concentration styrene oxide (0.2M) can be completely soluble in [Hmim][Tf2N], higher conversion was obtained in ILs compared to in buffer.