Non-aqueous biocatalytic reaction and enzyme mimic reaction fluoropolymer based and PDMS base microreactors

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We present a simple and effective method for fabricating microchannels from organic solvent resistant fluoropolymer and their application in non-aqueous biocatalysis. To best of our knowledge this is first we are presenting non-aqueous biocatalysis in elastomeric micro-reactor. The fluoropolymer microfluidic reactor was used to demonstrate the application enzymatic reaction in organic solvents. The use of organic solvents as reaction media for biocatalytic reactions is proposed to be an extremely useful approach to expanding the range and efficiency of practical applications of biocatalysis. The advantages of using organic solvents include, for example, increased solubility of hydrophobic substrates and favorable shifts of reaction equilibrium. We have also presented the application of PDMS microreactor to demonstrate the enzyme mimic reaction in droplet using sodium meta vanadate as the catalyst as a enzyme mimic of BPO for bromo-oxidation reaction. In this paper we have also discussed application of enzyme mimic reaction in two-phase (H_20-CH_2Cl_2) system mimicking the hydrophilic and the hydrophobic portions of vanadium dependent bromoperoxidases.