IMMOBILIZATION OF FUNGAL LIPASES ON ACCUREL MP1000 HYDROPHOBIC SUPPORT

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Lipases are widely used biocatalysts in the industry due to their ability to catalyse triacylglycerol hydrolysis, and trans- and interesterification reactions in eco-friendly way. The main limitations of their application are the moderate stability and the difficulties in the enzyme recovery. Immobilization of enzymes can improve their stability even under harsh reaction conditions, as well as allow the recovery and reusability in several reaction cycles. Among immobilization techniques, one of the most efficient method is the adsorption onto hydrophobic matrices such as the polypropylene Accurel MP1000. When this matrix is used as a carrier, a selective hydrophobic interaction can be established between the enzyme and the porous support. In this work, the commercial *Aspergillus niger*, *Rhizopus oryzae*, *Rhizopus niveus*, *Rhizomucor miehei* and *Candida rugosa* lipases were immobilized onto Accurel MP1000 support. We optimized the adsorption by changing the binding conditions (pH, temperature, time, enzyme volume). In addition, treatment of the enzyme-carrier complexes with 1-3% glutaraldehyde was also examined. Immobilization efficiency calculation indicated high affinity between the lipases and the hydrophobic surface. Biochemical characterization assays revealed improved stability of the immobilized lipases compared to the free enzymes. Glutaraldehyde treatment provided elevated stability for the enzyme-carrier complexes. The reusable biocatalysts developed can contribute to economical catalysis of industrial processes. This research was funded by the NKFI FK 134886 and connected to the project EFOP-3.6.1-16-2016-00008. A.K. is supported by the ÚNKP-20-4 New National Excellence Program of the Ministry for Innovation and Technology from the source of the National Research, Development and Innovation Fund.