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SIMPLE ECO-FRIENDLY β -GALACTOSIDASE IMMOBILIZATION ON FUNCTIONALIZED MAGNETIC PARTICLES FOR LACTOSE HYDROLYSIS

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Abstract

β -galactosidase from *Aspergillus oryzae* was strongly immobilized on magnetic particles functionalized with amino groups. By simple incubation without any activating agents, electrostatic interactions between amino groups and enzymes allowed obtaining a strong linkage. The immobilization efficiency was studied with the quantification of amino groups of the particles and of immobilized β -galactosidase. Kinetic parameters, especially the maximal velocity V_{max} and the affinity K_m , were determined with two substrates, o-NPG and lactose, and compared with free enzyme values in order to evaluate the influence of our immobilization methodology on the kinetic behavior of the enzyme. Therefore, magnetic capacity of the functionalized particles allows recovering and reusing the support. Results show efficient immobilization of β -galactosidase (58 μ g/mg of support), able to hydrolyze substrates during multiple cycles of use. Thus, magnetic particles functionalized with amino groups represent an attractive support for simple and efficient β -galactosidase immobilization process.

Key words: β -galactosidase, immobilization, lactose, magnetic, particles

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