DEVELOPMENT OF ENZYMATIC CATALYSTS BASED ON LIPASE VARIANTS IMMobilIZED IN SULPHONATED CARBONIC SUPPORTS FOR INDUSTRIAL USE

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The production of recombinant enzymes is one of the most promising market. Enzyme-catalyzed processes are applied in several industrial sectors due to high efficiency, specificity, and low energy requirements. Most biocatalysts applied to industrial processes consist on enzymes immobilized in insoluble resins. Immobilization increases the enzymatic activity and stabilization and also makes possible enzymes separation from the reaction medium, allowing multiple reutilization of the biocatalyst. Is believed that the development of new immobilization supports, combined with the use of enzymes modified by molecular biology and genetic engineering techniques may contribute to the development of new large scale process. This work aims to develop enzymatic catalysts immobilized on sulphonated carbonic supports for industrial use. For this end, it is intended to use recombinant Lipase B Pseudozyma antarctica (PALB and PantΔlidG3) transformed with his-tagged. Low cost supports are being synthesized in the process of enzyme purification and immobilization by carbonization and sulfonation of simple carbohydrates. Chemical tests to determine the morphological structure were performed. Amberlite commercial resins were also analyzed for their morphological structure. Catalytic efficiency of PALB lipase was measured by hydrolytic activity using pNPP degradation assay. The purified lipase PALB in IRN77.Ni²⁺ column showed catalytic activity of 522U/g in aqueous medium even in the presence of denaturing compounds. Among the resins synthesized, four were selected for immobilization tests based on the higher amount of acid sites and thermal stability. The use of recombinant enzymes immobilized on different sulphonated supports should contribute to the development of immobilized biocatalysts which may be applied on an industrial scale with less time-consuming and less production cost.

Key Words: Enzymes, Immobilization, Lipase.