

交联酶聚集体与仿生硅化技术结合制备固定化脂肪酶

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摘要 将交联酶聚集体 (CLEAs) 与仿生硅化技术相结合, 制备了交联脂肪酶 *Candida sp.* 99-125 杂化生物催化剂. 以京尼平为交联剂, 在最佳条件下制得的脂肪酶 CLEAs 的酶活达 771 U/g, 回收率达 75%; 保护剂聚乙烯亚胺 (PEI) 与 *Candida sp.* 99-125 脂肪酶共沉淀制备 P/CLEAs, 其酶活达 897 U/g, 回收率约 88%; 利用 PEI 的诱导作用, 在 P/CLEAs 表面形成氧化硅涂层, 制得的脂肪酶 CLEAs (Coated-CLEAs) 显示出良好的稳定性, 特别是其抗蛋白酶水解能力、有机溶剂耐受能力、重复使用性能等方面明显提高.

关键词: 交联酶聚集体 仿生硅化 假丝酵母脂肪酶 *Candida sp.* 99-125 京尼平 固定化酶

Abstract: The hybrid biocatalyst was prepared by the combination of cross-linked enzyme aggregates (CLEAs) and biomimetic silicification, where the lipase *Candida sp.* 99-125 was used as model enzyme. The preparation conditions of lipase-CLEAs were optimized and the resulting activity of 771 U/g was obtained. Under the optimum conditions, 75% of the activity recovery was obtained. P/CLEAs was prepared by coprecipitation of lipase with polyethylene-imine (PEI), and the resulting activity was 897 U/g. The activity recovery of P/CLEAs was about 88%. The silica coating was formed on the outside surface of P/CLEAs via the induction of PEI. The resulting Coated-CLEAs showed high reusability. The stability of the Coated-CLEAs, including the resistance to trypsin and organic solvents, was also significantly improved.

Keywords: cross-linked enzyme aggregate, biomimetic silicification, lipase *Candida sp.* 99-125, genipin, immobilized enzyme

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