

非水相中微生物脂肪酶催化转酯化拆分 (R,S)- α -苯乙醇

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摘要 研究了非水有机溶剂体系中脂肪酶不对称转酯化拆分 (R,S)- α -苯乙醇反应, 比较了 15 种不同微生物来源的脂肪酶, 从中优选出催化活性及对映选择性较高的脂肪酶 Lipase PS, 系统考察了影响该酶催化不对称转酯化反应的关键因素, 获得了优化的催化拆分工艺条件. 结果表明, 脂肪酶 Lipase PS 在非水反应体系中, 以正己烷为反应介质, 初始水活度为 0.75, 底物苯乙醇和乙酸乙烯酯浓度分别为 0.3 和 0.6 mol/L, 加酶量 5 mg/ml, 35 ° C, 200 r/min, 反应 14 h 后, 底物 (R,S)- α -苯乙醇的转化率达 44.7%, 产物 (R)-乙酸苯酯的光学纯度达 98.6%. 水活度可影响酶对底物的转化率和对映选择性.

关键词: 脂肪酶 转酯化 (R,S)- α -苯乙醇 对映选择性 水活度 (R)-乙酸苯酯

Abstract: By utilizing lipases that come from different microorganisms as catalyst, vinyl acetate as acyl donor, the asymmetric transesterification resolution of (R,S)- α -phenylethanol in non-aqueous media was conducted. Among the 15 enzymes investigated, lipase PS from *Burkholderia cepacia* showed higher activity and enantioselectivity. The effects of substrate concentration, reaction medium, enzyme dosage, reaction time, temperature, and water activity on the reaction were investigated. The results indicated that the optimal reaction conditions were as follows. The reaction was carried out with 5 mg/ml lipase PS, 0.3 mol/L (R,S)- α -phenylethanol, and 0.6 mol/L vinyl acetate in hexane. The mixture was then shaken under 35 ° C and 200 r/min with the initial water activity of 0.75 for 14 h. Under the optimal conditions, the substrate conversion could reach 44.7% with 98.6% ee of (R)-phenylethyl acetate. Water activity was found to be an important factor to the product enantioselectivity and substrate conversion.

Keywords: lipase, transesterification, (R,S)- α -phenylethanol, enantioselectivity, water activity, (R)-phenylethyl acetate

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