

Effect of Surfactants on the Kinetic Resolution of (R,S)-Naproxen 2,2,2-Trifluoroethyl Thioester by Using Lipase

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The enzyme-catalyzed resolution of racemic compounds is one of methods for obtaining optically pure substances. Lipase is an enzyme that catalyzes the hydrolysis of (S)-naproxen 2,2,2-trifluoroethyl thioester to (S)-naproxen. In this study, the effect of surfactants such as Triton X-100, Tween 80, M-SA 1025, SM 20 and NP-10 on lipase-catalyzed resolution of (R,S)-naproxen 2,2,2-trifluoroethyl thioester were investigated. M-SA 1025 showed the highest conversion (96.76%) among surfactants tested. The conversions of Triton X-100 (94.80%), SM 20 (93.35%) and NP-10 (95.97%) were higher than that of control (88.86%). Also, M-SA 1025 provided the highest initial reaction rate of (S)-naproxen 2,2,2-trifluoroethyl thioester ($V_S = 2.88 \times 10^{-2}$ mM/h) and specific activity ($V_S/(Et) = 9.564 \times 10^{-4}$ mmol/h·g) of lipase. The enantioselectivity of lipase was improved by addition of surfactants. Enantioselectivities (E value) of M-SA 1025 (E = 111.80), SM 20 (E = 70.59) and NP-10 (E = 59.24) were higher than that of control (E = 32.21). Therefore, among surfactants tested, M-SA 1025 was the most efficient surfactant for lipase-catalyzed resolution of (R,S)-naproxen 2,2,2-trifluoroethyl thioester.