

Lipase-catalyzed Esterification of (S)-Naproxen Ethyl Ester in Supercritical Carbon Dioxide

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Supercritical carbon dioxides are gaining highlights as a new reaction medium due to high diffusivity and enhancement in the yield. A lipase-catalyzed esterification reaction of (S)-naproxen ethyl ester by CALB (Candida Antartica Lipase B) enzyme has been performed in supercritical carbon dioxide. Experiments were performed in a high pressure cell for 10 hr with a stirring rate of 150 rpm at the temperature range of 313.15 ~ 333.15 K and in a pressure range of 50 ~ 175 bar. The esterification reaction products were analyzed by HPLC using a chiralcel OD column. The reaction temperature and pressure were optimized using the response surface methodology (RSM) approach. Total reaction time and conversion yields of the catalyzed reaction in supercritical carbon dioxide have been compared with those at the ambient temperature and pressure. Effects of using supercritical carbon dioxide as a reaction media have been presented.