

Enzymatic biodiesel production in packed bed reactor using supercritical carbon dioxide

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Supercritical carbon dioxide (ScCO₂) is gaining attention as an alternative media for enzymatic reaction with benefits of no toxicity and easy separation from products. In this study, a packed bed reactor system suitable for the continuous production of biodiesel using lipase and ScCO₂ as the reaction media was developed. It was found that immobilized lipase packed in the column reactor successfully converted the soybean oil in the input stream of ScCO₂ into the methyl esters and the conversion was comparable to the value from batch mode reaction system. Potential advantages of the system include easy recovery of the products (biodiesel and glycerol), fast conversion, and easy connection with the supercritical oil extraction process.