Continuous enzymatic production of butyl butyrate in a packed bed reactor

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Butyl butyrate was continuously synthesized by immobilized lipase, Novozym 435 in a packed bed reactor (PBR). Esterification reaction of butyric acid and butanol was quickly occurred without any by-product in organic solvent. Several solvent candidates were investigated to select the suitable solvent for the butyl butyrate production and heptane showed the highest efficiency. The effect of various parameters, such as temperature, molar ratio of butyric acid to butanol, flow rate on the conversion was inspected. The maximum conversion of butyl butyrate was obtained at 50 ℃, 0.5 or less of molar ratio. For continuous butyl butyrate production, the PBR system was stable and suitable model for scale up of process.