

Simulation of a Reactive Extraction Unit. Recovery of 2, 3-butanediol from fermentation broth

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2,3-butanediol (BDO) is an attractive chemical due to its vast applications in fuel and rubber industries, used as antifreeze agent and other miscellaneous. Fermentation broth has very low concentration of BDO that's why it needs huge capital for its separation. A novel process was proposed which completely separated the BDO. This study imposed on the rigorous simulation of reactive extraction as a separation process of BDO. The process involved three steps reaction, extraction and solvent recovery. Equilibrium and kinetics were determined by the reaction of BDO and aldehyde. More than 90% BDO was recovered by the novel reactive extraction method and up to 99% purity was achieved. This technique used less energy and less equipment as compared to the others. The recovery of used solvent (aldehyde) was also considered (more than 85%). This research was supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189) and Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A3A01015621).