# In-situ extraction of bio-based butyric acid through the enzymatic esterification

전재성, 상병인*
한양대학교
(biosang@hanyang.ac.kr*)

Butyric acid is a small fatty acid with diverse usages. Bacterial fermentation can be an alternative method for butyric acid production in light of the decrease in the petroleum. The recovery of butyric acid from fermentation broth is energy-intensive process. It is possible to perform enzymatic esterification of the produced butyric acid to butyl butyrate, and the extraction of this ester by extractant. Novozym 435 was selected as catalysts and tetradecane was used as a extractant, which was nontoxic to the cells. The very high partition coefficient of butyl butyrate pulls the esterification toward the ester even at relatively low concentration of butyric acid. The high pressure CO2-facilitated reactor was used to drop the pH of aqueous phase. Real fermentation broths produced from Clostridium tyrobutyricum could be successfully esterified. The esters could be used as final products, or hydrolyzed back to pure butyric acid. The principle may be extended to a wide range of esters, especially to longer chain ones.