

In situ recovery of butyric acid from anaerobic fermentor under high-pressured CO₂ condition

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Butyric acid is an attractive renewable chemical for many industrial applications, and be produced by anaerobic microorganisms. The high-pressured CO₂ reactor system for a liquid-liquid extraction was applied for the recovery of butyric acid produced by *Clostridium tyrobutyricum* (ATCC 25755). The pH below pK_a of butyric acid is recommended for the extraction of the butyric acid to extractant, and CO₂ was expected to decrease the pH of aqueous medium by forming bicarbonate. The high-pressured conditions at 10 ~ 50 bar lead to increase of CO₂ solubility into the fermentation broth. The extractive fermentation was operated in a fed-batch reactor connected with high-pressured CO₂ extractor. Fermentation broth containing butyric acid was filtrated by MF membrane for reutilization of *C. tyrobutyricum*. The butyric acid in filtrate was circulated with high-pressure CO₂ extractor and extracted to an extractant, ester solvent, at 50 bar. The pH of filtrate decreased according to increase of CO₂ pressure. The extraction process showed a good performance and could be applied to the other organic acids for bio-production