

Continuous production of Bio-ethanol using encapsulated saccharification and cell-free fermentation enzyme system

Muhammad Wajid Ullah, Waleed Ahmad Khattak, Shaukat Khan, Mazhar-ul-Islam, 유보
완, 박중근*
경북대학교
(parkjk@knu.ac.kr*)

Bio-ethanol is an important biofuel since last few decades. Various approaches are employed for improving bio-ethanol production via simultaneous saccharification and fermentation (SSF). However, difference in temperature optima of both saccharification enzymes and microbial cell growth is a major obstacle for bio-ethanol production via SSF. A modified system is required to carry out SSF at elevated temperature. Current study was aimed to develop a novel encapsulated enzyme-system to carry out SSF at elevated temperature without considering this limitation. Further, it was aimed to evaluate feasibility of such system in batch operation for bio-ethanol. Encapsulated enzyme-system was developed by co-encapsulating saccharification and fermentation enzymes in Ca-alginate by liquid droplet-forming method. Process was carried out at elevated temperature and produced bio-ethanol was determined through ethanol assay-kit using UV-spectrophotometer. Bio-ethanol production at elevated temperature via this system leads towards conditions optimization for SSF.