

Continuous Solvents Production with High Productivity Using an Engineered Strain of *Clostridium acetobutylicum*

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Continuous fermentation is considered as one of the suggested strategies for improving the solvent productivity of acetone-butanol-ethanol (ABE) fermentation. However, traditional continuous fermentation has the inherent limitation of cell wash-out when operated at high dilution rates. This problem can be addressed by applying high cell density continuous fermentation. The aim of the present study was to establish a continuous fermentation process for an engineered *C. acetobutylicum* strain which can result in high ABE productivity. A high cell density continuous ABE fermentation of the BKM19 strain in membrane cell-recycle bioreactor was studied and optimized for improved solvent volumetric productivity. Different dilution rates were examined to find the optimal condition giving highest ABE productivity. The maximum solvent productivities were obtained when the fermenter was operated at a dilution rate of 0.86 h⁻¹ with the bleeding rate of 0.04 h⁻¹. Under the optimal operational condition, ABE could be produced with the volumetric productivities of 21.1 g L⁻¹ h⁻¹, and the yields of 0.34 g L⁻¹.