

## Bioelectrochemical system for bioconversion process: C1 gas to VFA and methane

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The one-carbon conversion into value-added platform chemicals has been of great interest in industrial biotechnology due to the demand for syngas fermentation. Nevertheless, the biological one-carbon conversion process is difficult to be implemented into the industry due to lack of cost-effective process. The low conversion yield and/or cell growth rate of C1 gas-utilizing microbes hinders to develop appropriate biorefinery process for gas substrate. Recently, bioelectrochemical system based CO/CO<sub>2</sub> conversion provide a potential route to improve conversion efficiency and cell growth of strains. In this study, we investigated an optimized bioelectrochemical system (BES) system configuration and operational factors to overcome the conventional limitation of CO conversion. The gas composition and applied potential were examined with simultaneous estimation of coulombic efficiency. The volatile fatty acid production and their conversion efficiencies are compared in different operating condition.