

Bioconversion of carbon monoxide to formate by using *Acetobacterium woodii* as a biocatalyst with high cell activity

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If carbon monoxide is available as a carbon source, it will be a big advantage. And many researchers are actively conducting research to convert carbon monoxide into high value-added materials. As part of these researches, we performed the experiment to convert formate from carbon monoxide using *Acetobacterium woodii* as a biocatalyst. The ATP production system of *A. woodii* is strictly dependent on sodium ion, which can prevent further ATP synthesis in the cell by removing sodium ions. When the ATP synthesis is blocked, formate is accumulated instead of acetate. To optimize the system, we already tested productivity of formate according to cell growth phase and culture condition. In this study, the difference in formate production due to cell activity was approached more analytically. The difference in productivity of formate due to cell growth and culture conditions were confirmed in relation to the amount of ATP at the start of the conversion. In addition, samples were purged with various gas compositions to confirm the disappearance pattern of early ATP and the production of formate over time. The results would contribute to maintaining cell activity and reusing resting cells.