

Electricity generation in the two-compartment mediator-less microbial fuel cell using
Shewanella putrefaciens CN32

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Microbial fuel cells (MFCs) can be used to directly generate electricity from the oxidation of dissolved organic matter using microorganisms. Some microorganisms, such as *Shewanella putrefaciens*, Fe (III) reducing bacterium, can directly transfer electrons to electrodes using cytochromes localized in its outer membrane. Several studies have been suggested that *S. putrefaciens* can be used in the mediator-less microbial fuel cell. But in these approaches, efficiency of direct electron transfer between microbial cells and electrodes was very low, so performance of the MFC decreased. This is required to enhance the cell performance through increase of the specific electrode surface area or the addition of redox mediators in the bioreactor. In this study, the production of electricity by *Shewanella putrefaciens* CN32 was examined in a two-compartment fuel cell. Lactate which can be utilized by this strain was used as the electron donor in the anode compartment. Carbon fibers were used for both an anode and cathode site. Especially, cathode was prepared by applying a small amount of catalyst, typically carbon-supported platinum to enhance electricity generation.