

## Characterization of Microbial Fuel Cell (MFC) Performance and Losses by Electrochemical Impedance Spectroscopy (EIS)

정창문, 장호남\*  
한국과학기술원  
(hnchang@kaist.ac.kr\*)

Microbial fuel cell (MFC) can be used to directly generate electricity from the oxidation of dissolved organic matter. Driving forces of MFC are redox reactions of carbohydrate substrates by microorganisms. They transfer electrons to anode by extracellular electron transfer system or using a mediator, and electron flow through external load to cathode is electricity.

While the current-voltage curve provides general quantification of fuel cell performance, a more sophisticated test is required to accurately differentiate between all the major sources of loss in fuel cell. Electrochemical Impedance Spectroscopy (EIS) is the most widely used technique for distinguishing the different losses.

In this study, our objective is to understand the electrochemical losses and electrochemical phenomena taking place in MFC under various conditions. Also, impedance models will be described to characterize the performance of fuel cells.