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Microbial Fuel Cells: Concepts and Application

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As a clean energy source and an alternative to the conventional energy production device, a microbial fuel cell(MFC) has drawn much attention, in which intact microorganisms are utilized as catalysts for conversion of chemical energy into electrical energy. In a MFC, living organisms are an active component, oxidizing fuels such as carbohydrates in an anodic compartment. Since naturally occurring fuels are abundant and could be used with high efficiency, MFCs have been regarded as a promising means of interfacing biological energy sources with electrochemical technology.

Depending on the way of utilizing microorganisms and mediators, MFCs can be divided into several classes. In this talk, overall concepts, operating modes of MFCs, and the roles or operating conditions will be reviewed. For the applications in an real world, bipolar stack type MFCs and circulation type MFCs are also discussed.