Review

Microbial catalyzed electrochemical systems: A bio-factory with multi-facet applications

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Microbial catalyzed electrochemical systems: A bio-factory with multi-facet applications

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Abstract

Microbial catalysed electrochemical systems have been envisaged and rigorously studied as a futurustic and promising technology for value addition and bioenergy generation as they do not require any additional supply of energy unlike other waste treatment process. These systems use the potential developed *in situ* by bacterial metabolism for acheiving either treatment or production of value added products. The primary focus of this review is to insightfully document various advancements in the microbially catalysed bioelectrochemical systems along with their specific applications. Multiple and diverse applications of microbially catalysed bioelectrochemical system namely microbial fuel cell (MFC, for harnessing electricity), bioelectrochemical treatment (BET, wastewater treatment), bioelectrochemical syctem (BES) or microbial electrochemical synthesis (MES) and microbial electrolytic cell (MEC, H_2 production under low applied potential) have been comprhesnsively outlined. Special focus is given to the different exo-electron transfer machineries and strategies regulating them for directing the metabolic flux towards the electron transport machinery.

Keywords: Biocatalyzed electrochemical system; Bioelectrochemical treatment; Microbial fuel cell; Microbial electrolysis cell; Metabolic flux.