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Review

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

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**7 Abstract**

8 Microbial catalysed electrochemical systems have been envisaged and rigorously studied as a  
9 futuristic and promising technology for value addition and bioenergy generation as they do not  
10 require any additional supply of energy unlike other waste treatment process. These systems use  
11 the potential developed *in situ* by bacterial metabolism for acheiving either treatment or  
12 production of value added products. The primary focus of this review is to insightfully document  
13 various advancements in the microbially catalysed bioelectrochemical systems along with their  
14 specific applications. Multiple and diverse applications of microbially catalysed  
15 bioelectrochemical system namely microbial fuel cell (MFC, for harnessing electricity),  
16 bioelectrochemical treatment (BET, wastewater treatment), bioelectrochemical system (BES) or  
17 microbial electrochemical synthesis (MES) and microbial electrolytic cell (MEC, H<sub>2</sub> production  
18 under low applied potential) have been comprhesnsively outlined. Special focus is given to the  
19 different exo-electron transfer machineries and strategies regulating them for directing the  
20 metabolic flux towards the electron transport machinery.

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

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