

# Power Generation from Algal Biofuel Cell with Enzyme Based Electrodes Utilising Effluent Water

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**Abstract** The biggest challenge of today is minimizing the pollution and increasing the production of electricity with least utilization of non-renewable energy. To meet this challenge fuel cell can be a boon. Microbial fuel cell- MFC is a bio-electrochemical device used essentially for power generation and emerging sustainable waste water treatment system. In this work we have utilised the algal mass and anaerobic bacteria in MFC mediated by enzyme based electrodes. Since waste water contains high percentage of biomass,  $\text{CO}_2$ ,  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ ,  $\text{PO}_4^{3-}$ , Cr and another carcinogenic compounds. These substances will be consumed by algae for their growth and development during photosynthetic process. Consumption of  $\text{CO}_2$  will reduce the global warming gases to a large extent. This process will efficiently aid in waste water treatment without involving expensive chemical treatment. The use of enzyme based electrode will enhance the rate of reaction, thus increasing the productivity. Since enzyme can be produced in a laboratory in any amount and it is eco-friendly also. Due to photosynthesis the net amount of electron generated in the biofuel will be more, hence electricity generation will be increased in comparison with non-photosynthetic MFC. The cost effective and sustainable biofuel cell/ Microbial Fuel Cell (MFC) will open new horizons in diverse dimensions.

**Keywords:** Microbial fuel cell (MFC), algal biomass, renewable energy, Enzyme based electrode