

عنوان مقاله:

Experimental Investigations into Effective Parameters for Improvement of Current Density in Microbial Fuel Cells

محل انتشار:

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خلاصه مقاله:

Microbial Fuel Cells (MFCs) represent an environmentally-friendly approach to generating electricity, but the need to study variation parameters to find improvement conditions has been an important challenge for decades. In this study, a single-chamber MFC was designed to investigate the key parameters such as the concentration and type of bacteria, chamber temperature, electrode spacing, and substrate rotation speed that affected the performance of MFCs. Therefore, two types of bacteria, *Shewanella oneidensis* (S.one) and *Escherichia coli* (E. coli), were compared as microorganisms. Then, the function of MFC was investigated under the following condition: three temperatures (۳۰ , ۴۵ , and ۶۰), three bacterial concentrations (۰.۵% (v/v) (۴.۵ mg/ml), ۱% (v/v) (۹mg/ml), and ۱.۵% (v/v) (۱۳.۵mg/ml)), electrode distances (۲ cm, ۳ cm, ۴cm), and substrate speeds (۱۰۰ rpm, ۱۵۰ rpm, ۲۰۰ rpm). Ultimately, (S.one) bacteria, a chamber temperature of ۴۵ , a bacterial concentration of ۱% (v/v) (۹mg/ml), a cathode-anode spacing of ۳ cm, and a rotation speed of ۱۵۰ rpm proved to be the most efficient parameter settings for the constructed microbial fuel cell. The maximum voltage and highest power density were ۴۸۶.۹ mV and ۹.۷۳ mW/ , respectively, with a resistance of ۷۵۰۰ ohms. These results are meaningful for determining and improving important parameters in an MFC device

کلمات کلیدی:

Microbial fuel cell, Electrode, Current Density, Power Density

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