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Wastewater remediation and bioelectricity generation in dual chambered salt bridge microbial fuel cell: A mini-review

Abstract

The purpose of this article is to assess the feasibility analysis of microbial fuel cells (MFCs), particularly in the configuration of dual chamber salt bridge microbial fuel cell (DCSB-MFC), as a promising approach for simultaneous bioelectricity generation and wastewater remediation. The application of a salt bridge presents an economically viable alternative to the use of a proton exchange membrane, which is known for its high cost, in the construction of MFCs. This arrangement has been demonstrated to offer significant benefits in terms of enhancing the performance of new elements and evaluating operational parameters. However, it also encounters issues related to the total internal resistance (R_{int}) of the MFCs as well as power density (P). In addition, it has been found that traditional packing materials such activated carbon and gravel demonstrate poor permeability, internal resistance, and slow biofilm growth. Furthermore, there is a necessity to search for electrodes that possess high resistance to corrosion and are cost-effective to achieve optimal bioelectricity generation. Therefore, this article aims to emphasize the research areas that require attention. By addressing these areas, the actual implementation of this configuration can be brought closer to practical implementation.

Keywords

Bioelectricity production; Dual chamber salt bridge; Microbial fuel cell; Wastewater treatment