

BIOANODE IN MFC FOR BIOELECTRICITY GENERATION, DESALINATION AND DECOLORIZATION OF INDUSTRIAL WASTEWATER

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Abstract

The most attractive and eco-friendly technologies in biological treatment is Microbial fuel cells (MFCs). In this work desalination rate, organic pollution removal and energy production in the MFC with and without desalination function were compared. A modified MFC was designed and fabricated for desalination process. The rough surface graphite (RSG) was used as anode electrode in the both reactors. The modified MFC for desalination unit the columbic efficiency improved from 16.8 to 23.4%. Maximum power density and desalination rate were 13.4 W/m³ and 81.2 %, respectively. A consortium of Enterobacter had special potential to remove dye (Acid Red 27) while bioelectricity is generated. The open circuit voltage (OCV) for 0.3 g/L AR27 with 24h retention time at 30 °C was 0.81 V; while, 91 % decolourization was achieved. The obtained results demonstrated that in operated MFC with mixed culture of bacteria was successfully applied for the decolourization of AR27 dye and bioelectricity generation and salt removal.

Keywords: Bioanode, Bioelectricity, Decolorization, Desalination, Microbial Fuel Cells