Design and Performance of a Plant-Microbial Fuel Cell To Treat Kitchen Wastewater

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Pollutant removal efficiency and electricity production from kitchen wastewater are investigated with the design of an up-flow plant-microbial fuel cell (P-MFC) by coupling Canna indica L. and microbial fuel cell (MFC). The results show that the P-MFC works better than conventional MFCs. The maximum COD removal rate is 92.90% at the influent COD concentration of 2450 mg·L-1, and the maximum NH3-N removal rate is 59.20% at the influent NH3-N concentration of 59.20%. The overall removal rate peaks when the kitchen wastewater is diluted about 3 times. Electricity production is not ideal. The possible reasons are excessive internal resistance, the death of activated sludge aerobic bacteria, and the failure of canna to improve the amount of dissolved oxygen. P-MFC can help reduce kitchen wastewater pollution during storage and transportation, improve the quality of life, and beautify the urban living environment.

Awards Won:

Third Award of $1,000