Improved Energy Production in Microbial Fuel Cells by Means of Organic Mediation

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In a polluted world driven by energy consumption, one innovative idea, the microbial fuel cell (MFC), has risen as a solution to anthropogenic demands. MFCs are biological reactor systems that use metabolic activity of bacteria as a source of electrical energy. As bacteria oxidize compounds in their normal reactions, the released electrons are used for alternative energy production. Recent discoveries have demonstrated the effects of different mediation factors in the design of MFCs; however, researchers have encountered obstacles when it comes to increasing power production in them. Based on previous experimentation, a series of trials were developed in this research with the purpose of proposing an alternative method for enhanced energy production in MFCs. It was hypothesized that higher energy in MFCs would result from increasing concentrations of organic substrate in the anodic chamber. Using common materials, a two-chambered microbial fuel cell was successfully constructed and tested using glucose as the substrate with three different concentrations [2 g/L, 4 g/L, and 6 g/L] and wastewater as the bacterial medium. The data demonstrated how the optimum concentration was of 2 g/L for the microbial fuel cell, while concentration did not seem to increase current and voltage in the cell. For future research, it was recommended that the same experiment be done using a single-chambered MFC in order to compare the efficiency and energy production of both. More time should also be allotted to test each concentration to seek variations in the data.

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