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Improved Efficiency of Microbial Fuel Cells

The purpose of this project was first to discover if power could be generated in a MFC from pond sediment taken from Doty Pond in Brush. This then led to optimization of the power that could be obtained from the MFC by designing the most efficient external circuit based on the amount of external resistance. Experimentation was done by constructing a MFC consisting of two chambers connected by a salt bridge and external circuit. Pond sediment was used as a source of power for the anode. The external circuit was designed such that current and voltage across different resistors could be recorded over the course of five days. The sediment from Doty Pond proved to produce power. The optimal resistance was found to be consistent with the equation V=IR. It was observed that the optimal value of resistance hardly varied between days, though the amount of power produced did. The effect of internal resistance on the optimal external resistance was analyzed. After calculating the internal resistance of the MFC, it was discovered that the two were equal. Further calculations of the data also revealed that the internal resistance of the MFC and the voltage produced were constants throughout each days testing period. This project demonstrates that power can be produced from benthic sediments in a MFC. The analysis of the data indicates that maximum power is obtained from a MFC when the external resistance is equal to the MFCs internal resistance.