CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

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Project Number

J0204

Project Title

From Crap to Zap: Using the Microbial Fuel Cell to Extract Electricity from Waste

Abstract

Objectives/Goals

This experiment uses mud taken from streams as a substitute for wastewater, and compares the amount of electricity produced from the different streams.

Methods/Materials

Five variations of Microbial Fuel Cells that contained different mud were tested to see how much energy they produced. Every day for twenty-four days the voltage and current produced in each MFC were measured and recorded. The purpose of this experiment was to compare the different amounts of electricity produced by each sample.

Results

The energy produced followed a pattern. Throughout the cells this was similar. Within the first 13 days the numbers peaked, and then declined. After that, the measurements were generally consistent. Another question was which variation would produce the most energy. Although it was predicted that the control would produce the most electricity, that variation ended up producing negative numbers. Variation four produced the most.

Conclusions/Discussion

Variation four produced the most because it was taken from the Santa Ana River. This mud sample resembled mud more than sand. This was the second pick for which variation would produce the most electricity. The control produced negative electricity because the carbon cloth fell off the electrodes, which then rusted. The hypothesis was correct about variation 4, and was incorrect about the control. The hypothesis was also correct about the pattern. The MFCs worked best with mud from a rich environment, when it was thick and not very grainy. This means that only specific bacteria will work well with MFCs.

Summary Statement

Microbial Fuel Cells took advantage of the respiration proccess of bacteria in mud and used this process to extract electricity.

Help Received