CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0205

Project Title

Urine's Potential as a Biofuel

Abstract

Objectives

The objective of this project was to determine if the components of urine could be utilized by bacteria to aid in the production of electricity in a microbial fuel cell.

Methods

In order to test this hypothesis, 2 microbial fuel cells were prepared with an anode and cathode, a hacker board, an led light, a capacitor, soil, and water. A digital multimeter was used and the power of the microbial fuel cells was measured and recorded with 7 different resistors. Once the microbial fuel cells demonstrated stable power production with water, which served as our control, urine was added to each vessel. The first microbial fuel cell was given 1 mL of urine and the second was given 5 mL of urine. The microbial fuel cell's energy production was recorded over the course of 25 days. The idea to conduct this experiment came about after research on alternate forms of energy and a review of www.sciencebuddies.org, which outlined how to go about such an investigation.

Results

It was observed that both microbial fuel cells had significant increases in power. When the data was analyzed, the results showed that the microbial fuel cell with 1 mL of urine increased in the production of power by 52% and the microbial fuel cell with 5 mL increased in production by 313%.

Conclusions

The conclusion was drawn that adding urine to a microbial fuel cell does improve its electricity production. This study contributes to the field of knowledge in alternate and sustainable fuel which will benefit all of humanity.

Summary Statement

We demonstrated that urine can be utilized in a microbial fuel cell to generate electricity.

Help Received

Mr. Robert Perez, an engineer, gave us guidance on how to analyze our data.