CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

S1013

Project Title

Generating Energy through a Microbial Fuel Cell: Effects of Sodium Chloride

Abstract

Objectives/Goals

This project is based on determining how adding Sodium Chloride affects the power output of a microbial fuel cell. We hope to improve upon the environment through analyzing the impact of NaCl in a MFC. The need for renewable energy has driven our focus towards the MFC, a pollution free source. Electricity, a form of energy, with the use of bacteria in topsoil, can be harnessed through a MFC. However, this project is an initiation towards finding a rapid and more efficient method. We focus on using a basic mineral substance, salt, to improve upon the power output of a fuel cell. Finding the amount of energy the sodium chloride increases will be a step towards advancing energy for the world.

Methods/Materials

-Micro-Bio Fuel Cell kit:
* MFC vessel, * LED light, * Cathode, * Anode, * Hacker board, * Capacitor, * 7 different energy level resistors, * Multi-meter,
-Others:
* Top Soil, * Sodium Chloride (salt).

Results

As we took the power output everyday until the it seemed to stabilize, the power output of the peak power and all the other resistors slowly increased. The increasing trend was gradual at first, when we added the salt on the 8th day, the power output the next time we checked the power output instantly increased by more than 1 # 10-11. Bonding allows salt to speed up the reaction and delivers the energy faster to the LED light. By the 11th day, the excess amount of salt piling in the soil will cause the bacteria to slowly die off; this is why the power output has decreased.

Conclusions/Discussion

A fuel cell in general is an invention which generates electrical current that can perform work out of the cell, such as powering a light bulb, or an electrical motor engine. Fuel cells offer an efficient way to alternate the combustion of gasoline and other fossil fuels. With the use of chemical energy from hydrogen, electricity is produced, furthermore creating water and heat as byproducts. Fuel cells can be argued to be the most efficient energy generating solution ever invented, as they can run indefinitely due to the abundant source of hydrogen and oxygen. When we first thought of a project topic, we wanted something which could make a positive difference. After an amount of extensive research, we turned our attention to microbial fuel cells, and its focus on producing clean, renewable energy.

Summary Statement

Experimenting a new method to improve upon an alternate, clean, and renewable source of energy.

Help Received