Electrifying Lake Mud - More Power

Smith, Fianna (School: Herriman High School)

With needs for electrical power increasing around the globe, this work will present a novel solution to meet energy demands by using the alternative energy generation of microbial fuel cells (MFC). The present work is a continuation focused on using Great Salt Lake mud as the source material because of its abundance source of Geobacters. The project focuses on showing that MFCs can be tuned by dimension and spacing between the anode and cathode. 15 different MFCs sizes measuring 125 to 4000 cm3 were assembled and the anode/cathode spacing at 5, 7.5, and 10 cm. Finally, a Nafion NR212 Ion Exchange Membrane was added at a spacing 1 cm from the anode. The MFCs were placed in a series/parallel configuration to generate 5 Volts at 1 Amp to enable charging a cell phone. I found a key correlation showing increasing power generation as the X & Y dimension increased. The Anode/Cathode spacing did not show a correlation past 7.5 cm, showing a limit in the delta Z spacing. I also found that Geobacter colonies showed growth limits. Using 15 MFCs assembled into a series/parallel circuit, a total of 5 volts DC at 1 amp was generated. This was used to charge a cell phone for more than 20-days and proved that equipment in remote locations can be powered freely using natural bacteria living in the ground.

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