

Fabrication of single chamber microbial fuel cell (SMFC) using soil as a substrate

ABSTRACT

This paper presents a Single-chamber Microbial Fuel Cell (SMFC) design by utilizing soil as a substrate with two sets of electrode combinations, which are graphite-activated carbon and copper-zinc of different sizes. It was found that graphite and activated carbon produced greater power density compared to copper and zinc. Moreover, it was observed that the graphite-activated carbon cloth electrode with a bigger surface area of 51cm² resulted in a higher power density of 904mW/m². To further improve the voltage production of this model, four SMFCs were stacked in series and connected to a DC-DC boost converter to increase the voltage to 1.482 V for the copper-zinc electrode and 1.722 V for the graphite-activated carbon electrode, respectively, which was sufficient to light up an LED light.