ABSTRACT

Microbial Fuel Cell is one of the type of renewable energy to produce electricity continuously with the availability of supply, or external fuel. MFC system is a device that uses bacteria as a catalyst to oxidize the organic and inorganic substances to generate an electrical current. This study aimed to investigate the relation of metal material selection such as zinc, aluminum, and copper in the form of plates with a 10 cm2 of the surface area, as an electrode on the performance of the MFC system. The reactor used in this study is a dual-chambers MFC with each compartment having a 5 cm × 10 cm × 10 cm of dimensions. In the dual-chambers MFC system, the electrons produced by the bacteria of the substrate in the anode compartment are transferred to the anode electrode and flow toward the cathode electrode, while the protons are transferred to the cathode compartment through the salt bridge. Mud fields used as a substrate in the anode compartment, distilled water is filled in the cathode compartment, and the salt bridge (1 M NaCl) as a proton transfer medium. The results showed that the maximum power density that can be generated from the MFC system reached 30.54 mW / m2 (65 minutes) with electrode Cu / Zn for the first measurement, and 32.62 mW / m2 (145 minutes) with electrodes Zn / Cu for a second measurement. The acquisition of current and voltage on both of measurement are not different significantly, the overall current value increase along with the length of time of measurement. Based on the results of this study concluded that the production of the highest electrical energy produced by the combination of electrodes with zinc and copper material.

Keywords : *Microbial Fuel Cell*, mud fields, electrode