ABSTRACT

At this moment the needs for electrical energy still depends on fossil energy, even though the reserves from fossil energy are decreasing every day, therefore a lot of research is being conducted towards technology that is more effective, efficient, and especially environmentally friendly in producing electrical energy. One of these alternative energies is the Microbial Fuel Cell (MFC) which uses bioelectrochemical principles by utilizing microorganisms to break down the substrate to produce electrical energy. Electrons produced by bacteria from the substrate are transferred to the anode and passed to the cathode which is connected to an external circuit, giving rise to an electric current. In this study using a single chamber type reactor which is a sediment type Microbial fuel cell. The sediment consists of mud from paddy fields around the Telkom University area which is mixed using banana peel waste. This reactor uses electrodes with a surfaces area of 3 cm^2, 3.5 cm^2, 4 cm^2, 4.5 cm^2, 5 cm^2, 5.5 cm^2, 6 cm^2, 6.5 cm^2 and data collection will be carried out. for 7 days. The results of this study, each reactor produces an average power density of 7.122216 mW/m^2 for reactor 1 (electrode 3 cm^2), 7.271863 mW/m^2 for reactor 2 (electrode 3.5 cm^2), 7.792936 mW/m^2 for reactor 3 (electrode 4 cm^2), 10.031458 mW/m^2 for reactor 4 (electrode 4.5 cm^2), 14.70356 mW/m^2 for reactor 5 (electrode 5 cm^2), 16.255462 mW/m^2 for reactor 6 (electrode 5.5 cm^2), 16.255462 mW/m^2 for reactor 7 (electrode 6 cm^2), and the last one is 21.442501 mW/m^2 for reactor 8 (electrode 6.5 cm^2). The surface area of the electrode effect on the value of the resulting current, this can happen because the larger the surface area of the electrode, the greater the current value, but the resulting current value is not linear with the surface area of the electrode used.

Keywords: *Electrodes, microbial fuel cell, sediment*