ABSTRACT

The increasing need for electrical energy and the diminishing availability of conventional energy in Indonesia has triggered various researches on future alternative technologies that are more effective, efficient and environmentally friendly for producing electrical energy. One of the alternative technologies that can be developed is Microbial Fuell Cell (MFC), which is a technology that can convert chemical energy into electrical energy through catalytic reactions with the help of microorganisms. The construction of the Microbial Fuel Cell (MFC) reactor used in this study is a dual chamber system equipped with a proton exchange medium in the form of a salt bridge and electrodes in the form of zinc plates (Zn) and copper plates (Cu). In this study, variations in the viscosity of the tempe industrial waste substrate were added to the rice field sludge in the Telkom University area with a volume ratio of 3: 1, 1: 1, 1: 3. At a volume ratio of 1: 3, the results is an average electric current 0.174 mA and an average power density 47,60 mW / m² which is the highest on R3V13. However, the lowest average power density was obtained at a volume ratio of 1: 1, therefore at a volume ratio of 1: 1, further research was carried out regarding the substrate incubation time. In the study, the incubation time of the tempe industrial waste substrate for 7 days produced an electric current of 0.98 mA and a power density of 489.00 mW / m² which was the highest with the others. This is because the incubation time of the substrate increases the source of organic matter and bacteria in the MFC system.

Keywords: Microbial Fuel Cell (MFC), tempe industrial waste, electrical energy.