ABSTRACT

The increasing time the need for electricity will continue to increase. Currently, electricity still uses fossil fuels as its main source and over time the availability of fossil fuels will run out, so alternatives are needed to replace fossil fuels as renewable energy sources. Microbial fuel cells (MFCs) are one of the alternatives that can be used as a substitute for fossil fuels to produce electrical energy. MFCs use bacteria as catalysts in the oxidation process of organic and inorganic substances that have the purpose of producing electricity. In this study, tubular MFCs are used as the main system that is carried out on a semi-continuous basis that aims to optimize the system with the condition of the substrate used dynamically, namely the substrate moves towards the system and put of the system. The system is operated by draining the substrate first from the initial compartment sensor, the streamed into the final compartment for optimization which then the substrate will be streamed back to the initial compartment using a water pump. The experiment was conducted using variations in substrate composition against variations in flow rate. From the study conducted over 12 days obtained the best average electricity production of 0.63 mW using a substrate composition ratio of 14:1 L, when compared to using a ratio of substrate composition of 10:5 L and a ratio of substrate composition of 12:3 L which is only able to produce an average power of 0.33 mW and 0.34 mW.

Keyword: *Flow rate, power, tubular MFC*