ABSTRACT

The demand for electric energy, especially in Indonesia, continues to increase. While the availability of fossil energy sources is dwindling. Bio-electrochemical-based renewable energy can be used as a solution. Microbial fuel cell (MFC) is one of the bio electrochemical-based devices. The goal to be achieved in this study is to find out the effect of chamber volume variations on stacked MFCs on electricity production. The system to be built is three stacked MFC units. Each stacked MFC consists of two MFC dual chambers with chamber sizes of 10 x 2 x 10 cm each in MFC A, 10 x 3 x 10 cm in MFC B, and 10 x 4 x 10 cm in MFC C. The type of PEM used is Nafion 117 with a size of 4 x 4 cm. The cathode compartment uses a copper plate (Cu) of 4 x 4 cm with aquades as a solution. The anode compartment uses a 4 x 4 cm zinc plate (Zn) with a mixed substrate of fish pond water and cane bagas rinse water with a ratio of 5:1. The experiment was conducted by connecting stacked MFC reactors in series and parallels. From the measurement results, the average electricity production for 15 days with a maximum value of 0.028 V in the stacked MFC C series, 0.615 mA on the stacked MFC C parallel circuit, and 0.015 mW on the stacked MFC C series series. Meanwhile, based on substrate volume and chamber width used stacked MFC A is 38% more efficient than stacked MFC B and 52% compared to stacked MFC C.

Keywords: *stacked MFC, chamber volume, voltage, current.*