

ABSTRACT

The need for electricity consumption is increasing and the use of fossil fuels energy is still the main choice even though the source of fossil fuels energy reserves is decreasing and the utilization also produces greenhouse gas emissions which can worsen the environment. An alternative aside the fossil energy which can be renewable is needed. Currently, the renewable energy that is being developed is the microbial fuel cell (MFC), which is a system that can generate electricity from a substrate containing organic material which is oxidized by microorganisms as a catalyst. In Indonesia, a lot of small industries of tofu factory do not have sewage drains which meet quality standards, so their direct disposal of waste into rivers or water bodies can cause pollution. The use of tofu wastewater in addition to reduce the disposal of waste which can become pollutants was chosen because tofu wastewater still contains organic materials which are protein, carbohydrates and fats which can be used as an energy source for bacterial metabolism. This research used a single chamber reactor type, which is a type of sediment microbial fuel cell. The sediment consists of paddy mud around Telkom University mixed with organic material in the form of tofu wastewater from the Tofu Factory Jl. Nyalindung in Dago, Bandung. The results of the study showed that reactor I containing 800 ml of paddy mud had the greatest average voltage, current, and power density during the 15 days of the research, with respective values of 0.573 V, 0.306 mA, and 745.762 mW/m². In this research, the adaptation of microorganisms in paddy mud as the source of bacteria will take longer time if the added volume of tofu wastewater is more than the volume of paddy mud, because the addition of tofu liquid waste has a low pH, so microorganisms need time to adapt to new conditions in order to obtain the optimum conditions for metabolism activity so that it can produce electrons.

Keywords: microbial fuel cell, sediment, paddy mud, tofu wastewater.