ABSTRACT

Microbial Electrolysis Cell (MEC) is a new and promising approach for the production of hydrogen (H_2) from organic materials, including wastewater and other renewable resources. The purpose of this study was to determine the variation of the concentration ratio of Na_2SO_4 in producing hydrogen gas (H_2) and knowing the concentration of hydrogen gas (H_2) produced by the Microbial Electrolysis Cell (MEC) system using a cement membrane and the addition of Na_2SO_4. The design of this tool is designed to use a dual chamber consisting of two parts, namely the anode and cathode. The reactor is connected to a porous membrane with cement and sodium sulfate (Na_2SO_4) as the base material. The substrate used in this study was pineapple peel which was fermented for two days and rice field mud which would be placed in the anode reactor, while distilled water would be placed in the cathode reactor. This research focuses on optimizing the addition of sodium sulfate (Na_2SO_4) to MEC using cement. The porous membrane was made by varying the concentration of sodium sulfate (Na_2SO_4) to produce the best hydrogen gas (H_2). In this research, the optimal concentration of sodium sulfate (Na_2SO_4) to produce hydrogen gas (H_2) is 10.06 mol/L at a voltage of 2.4 Volts. Hydrogen gas (H_2) is mostly produced at a concentration of sodium sulfate (Na_2SO_4) of 10.06 mol/L with a voltage of 3 Volts, which is 2632 PPM. The concentration of sodium sulfate (Na_2SO_4) and the magnitude of the voltage are very influential in producing hydrogen gas (H_2) in this study.

Keywords: Hydrogen Gas, MEC, Purous Membrane, Substrate