Productivity Research of Electrolyzer Dry Cell Type Using Solar Panel Power Input and Electrode Variations on Oxyhydrogen Production
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ABSTRACT

The increasingly demand for fossil energy has an impact on increasing greenhouse gas emissions and climate change, which is a problem faced by every country in the world. Therefore, alternative energy sources are needed in large quantities, the manufacturing process does not produce emissions, and the consequences of the energy use process do not cause damage or side effects. Electrolysis is an easy way to produce new hydrogen energy, which can be combined with renewable energy sources such as solar panels to produce clean and sustainable hydrogen. In this study, a dry cell electrolyzer was designed, using 316L stainless steel and 304 stainless steel electrodes as neutral plates, changing the cathode and anode. The electrolyte used is potassium hydroxide (600 ml water: 100 g KOH) with a concentration of 16%. Using PWM (Pulse Width Modulation) with a duty cycle of 50%. and a frequency of 1Khz. The solar module used has a capacity of 20Wp as a 12V 12Ah battery charger. The largest volume of oxyhydrogen gas can be produced using variation 1 (2 Cathodes 1 Anode) of 9000ml within 60 minutes with an average flow rate of 2.67ml/s. The power consumption used has an average power of 32.82-Watt during with an average working voltage of 10.71 V and an average flowing current of 3.07 A, the resulting efficiency is 54%.

Keywords: *HHO, Hydrogen, Water Electrolysis, Solar Panel, Electrode***.**