

ABSTRACT

THE EFFECT OF BATTERY VOLTAGE BASED ON SOLAR CELL AND TYPE OF ELECTROLYTE ON HYDROGEN GAS PRODUCTION IN THE WATER ELECTROLYSIS PROCESS

(Dery Apriansyah, 2025 : 35 Pages, 21 Tables, 11 Figures, 3 Appendices)

Based on Government Regulation No. 79 of 2014 concerning the National Energy Policy, Indonesia targets the share of new and renewable energy in the national energy mix to reach at least 23% by 2025 and 31% by 2050. According to the Global Solar Atlas data (December 1, 2024), the city of Palembang receives solar irradiation of 2.421 kWh/m²/day or 883.7 kWh/m²/year. In the electrolysis process, water is the main raw material used to separate hydrogen and oxygen using an electric current. This research applies the electrolysis method by utilizing electricity from a solar cell to separate hydrogen and oxygen content in water with the assistance of KOH and NaHCO₃ as electrolytes. The controlled variables in this study include voltages of 4V, 6V, 8V, 10V, and 12V, a duration of 5 minutes, 12 electrode cells, and two types of electrolytes (KOH and NaHCO₃) with a concentration of 0.5 M. The results showed that the most optimal electrolyte solution for hydrogen gas production was KOH at 12V, which produced 0.3024 L. The electrolyte solution with the best performance in terms of Specific Energy Consumption (SEC) was NaHCO₃, with a value of 21,436.94 J/L.

Keywords: Electrolysis, Hydrogen, Electrolyte, Voltage.