

ABSTRACT

Aluminum-air batteries are currently a focal point of research due to their promising potential compared to conventional batteries, particularly in terms of high energy density and environmental friendliness. However, the main challenge with these batteries is their low voltage and power output, necessitating further research to enhance their performance. In this study, copper plates are used as the anode and a 1 molar KOH solution as the electrolyte, with carbon and graphite catalysts to accelerate the redox reactions. The battery system was tested to generate 12 volts of voltage and was capable of powering an LED light for 12 hours while displaying battery information. The testing methods included measuring voltage, current, and power, as well as analyzing the internal resistance of the battery. Test results indicated that although the battery can produce 12 volts, the current generated is very low, causing the LED to only last for 5 hours with dim illumination. The monitoring system used showed fairly accurate results, with voltage error percentages ranging from 0.067% to 1.292% and current error percentages ranging from 0% to 0.289%, indicating that the monitoring system can provide clear information about the battery's condition during operation.

Keywords: Aluminum-air battery, internal resistance, power, street lighting, voltage