

ABSTRACT

Name : Agung Sudrajat
Department : Electrical Engineering
Thesis Title : Analysis of Aluminium-Air Battery Module Performance of The Oxygen (O₂) Concentration Variations in Isolated Space

Aluminum air batteries (Al-air batteries) are now quite widely developed because they have inherent properties that are safe and cheap, but have the disadvantage of limited life because they have self-corrosion properties. Aluminum air batteries from existing research have a voltage in one battery cell of approximately 1-1.3 Volts and a current capacity of 110-368 mAh. The purpose of this research is to analyze the characteristics of Electrochemical Impedance Spectroscopy (EIS), Cyclic Voltammetry (CV) and Capacity (mAh) of aluminum-air batteries. The component of the aluminum air battery used is an aluminum plate as an anode, oxygen absorbed by TiO₂ catalyst as an air cathode, KOH as an electrolyte and tissue sheet as a separator. Testing is done by inserting the battery into an insulating box that will be filled with oxygen with variations of 21%, 30%, 40%, 60%, 70%, 90% at a pressure of 5 Psi and pressure variations with a concentration of 90% concentration at 3 Psi, 5 Psi, and 7 Psi. The results showed that the battery with 90% variation has the largest CV area which is able to produce a more stable discharge current. The 90% variation has a decrease in the value of the charge transfer resistance after discharge, and the one with the largest capacity is the 90% variation at 7 psi pressure which is 403.863 mAh.

Keywords: Aluminum air battery, oxygen, CV, EIS, capacity