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Fabrication and Characterization of Supercapacitor with Activated Carbon Electrode and NaOH Electrolyte (Conference Paper)

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Abstract

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A simple RC equivalent circuit model often used to represents a supercapacitor . The model is far from accurately model the behavior of the device. A 2cm by 2 cm supercapacitor prototype based on Activated carbon as the active electrode material and NaOH as the electrolyte was fabricated. This prototype was characterized using Cyclic Voltammetry and Galvanostatic Charge Discharge to get the supercapacitor working potential window, capacitance and internal resistance. The device works up to 0.7V with capacitance of up to 1.6F and internal resistance as low as 190 Ohm was found for the prototype. Several equivalent circuit model of a supercapacitor was simulated to produce similar response of the prototype. Multiple Branch Parallel RC circuit response profile fit the experimental profile the best. © 2018 IEEE.

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Author keywords

Characterization | Cyclic voltammetry | EDLC | Equivalent circuit modelling | Galvanostatic charge discharge | Supercapacitor

Indexed keywords

Engineering controlled terms: Activated carbon | Capacitance | Characterization | Circuit simulation | Cyclic voltammetry | Electric discharges | Electrochemical electrodes | Electrolytes | Equivalent circuits | Fabrication | Sodium hydroxide | Supercapacitor

Engineering uncontrolled terms: Activated carbon electrode | Active electrode materials | EDLC | Equivalent circuit model | Equivalent circuit modelling | Fabrication and characterizations | Galvanostatic charge discharges | Internal resistance

Engineering main heading: Electrolytic capacitors

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