

## Single Step Carbonization-Activation of Durian Shells for Producing Activated Carbon Monolith Electrodes

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Four types of monolithic carbon electrodes were prepared from durian shell waste by a one-step carbonization-activation process. The activation process was performed physically at a temperature of 900 °C for 1 hour. The carbon electrodes were produced with various amounts of (i) CO<sub>2</sub> gas and (ii) steam activating agent. For both types of activation processes, the samples also varied according to their electrode particle size, i.e., (a) particles smaller than 38 microns and from to (b) 39 - 52 microns. After varying these four factors, we produced a monolithic carbon electrode with a highest specific capacitance of 130.35 F g<sup>-1</sup> with the steam activating agent and a particle size of 39-52 microns. The optimized electrochemical properties were evidenced by the physical characteristics, such as the density, specific surface area and surface morphology. The results of this study present a relatively simple process for producing supercapacitor electrodes made from durian shell waste.

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**Keywords:** Durian shells, carbon electrode, specific capacitance, supercapacitor

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