



Development of easy made low cost bindless monolithic electrodes from biomass with controlled properties to be used as electrochemical capacitors

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ABSTRACT

The aim of the work now reported is the development of low cost electrodes in the monolithic shape without the need for a post-production step with potential to be used in supercapacitors. The tested materials were activated carbon fibres prepared and activated carbons made from coffee endocarp. The main functional groups identified were quinone, lactone, Si-H, phenol, hydroxyl, carbonyl and ether for activated carbon samples and amine, amide, pyrone, lactone, carbonyl and hydroxyl for activated carbon fibres samples. The nanostructure of the materials is predominantly microporous but with a significant variety of porosity development with BET surface area and pore volume given by α_s method range from 89 to 1050 m² g⁻¹ and 0.04 to 0.50 cm³ g⁻¹, respectively. The electrochemical properties of the materials were investigated using classic cyclic voltammetry, chronopotentiometry and electrochemical impedance spectroscopy. The higher specific capacitance achieved was 176 F g⁻¹.

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