Short Communication

Production of an Activated Carbon from a Banana Stem and its application as electrode materials for Supercapacitors

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The production of activated carbon electrodes from a banana stem for supercapacitor cell applications has been successfully performed. The increase in pore properties was conducted using a KOH chemical activation agent at low concentrations of 0.0, 0.3, 0.5 and 0.7 M, whereas physical activation was performed using CO₂ gas at a temperature of 850 °C for 2 h. The activated carbon electrode was fabricated without the addition of adhesive materials. The density, degree of crystallinity, surface morphology, elemental content and surface area of the electrodes were analyzed. The study of electrochemical properties focused on the analysis of the specific capacitance of the supercapacitor cell using cyclic voltammetry. The physical properties of the activated carbon electrodes were correlated to generate the optimum conditions for the specific capacitance of the supercapacitor cells. The optimum specific capacitance obtained at a concentration of 0.5 M KOH reached 170 F/g with a specific surface area of 835.939 m²/g.

Keywords: banana stem; activated carbon; specific capacitance; supercapacitor

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