Production of Activated Carbon Electrodes from Sago Waste and its application for an Electrochemical Double-Layer Capacitor

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Research on the utilization of sago waste as an activated carbon electrode for an electrochemical double-layer capacitor (EDLC) has been successfully performed. An important part of the EDLC is the highly porous activated carbon electrode that is prepared without the addition of adhesive materials with an optimum physical activation time. The sago waste-based activated carbon was prepared without adhesive materials with different physical activation times of 0.5, 1.0, 1.5, 2.0 and 2.5 hours. The effect of the physical activation time is discussed in terms of the physical and electrochemical properties of the carbon electrodes. The evaluated physical properties of the electrode include the density, surface morphology, chemical element content, degree of crystallinity and surface area. The electrochemical properties of the supercapacitor cells were studied for specific capacitances on a two-electrode system using the cyclic voltammetry method. The optimum specific capacitance of the sample electrode was 132 F g⁻¹, which was achieved with an activation time of 2.5 hours.

Keywords: sago waste; physical activation time; supercapacitor

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