

Preparation and Activation of Corn Straw-Based Carbon and Its Application in Supercapacitors

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The corn-straw is made into a biomass porous carbon material using three different activation methods. The porous carbon produced using KOH as the activator shows the best electrochemical performance compared to carbons produced by other methods. When the ratio of KOH to raw material is 2:1 and the activation temperature is 800 °C, the specific surface area of the obtained carbon material is 1067.11 m²·g⁻¹, and the capacitance reaches 239 F·g⁻¹ at a current density of 1 A·g⁻¹. In addition, the capacitance was maintained at 97.12% after 5000 charge and discharge cycles at a current density of 1 A·g⁻¹ in a 6 M KOH aqueous electrolyte. The conversion of corn-straw into green porous carbon materials not only enables them to be used at high values, but also solves the problem of pollution caused by the treatment of biomass waste.

Keywords: activated carbon; various activation methods; electrode materials; capacitive performance

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