

Preparation of High Specific Surface Area Activated Carbon from Black Wolfberry Branches as an Efficient Electrode Material for Supercapacitors

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Black wolfberry branches are used as raw materials, and the KOH activation method is adopted for producing activated carbons with a high specific surface area. The characterization of the material reveals that with increasing activation temperatures, the specific surface area (SSA) and interconnected microporous/mesoporous structure are augmented. The SSA of the prepared material reaches $2046.07 \text{ m}^2 \text{ g}^{-1}$ and a high pore volume of $0.7 \text{ cm}^3 \text{ g}^{-1}$ is obtained. Furthermore, the prepared material exhibits excellent electrical performance. As an electrode material, the specific capacitance is as high as 355.7 F g^{-1} at a current density of 1 A g^{-1} , and the capacitance loss rate is 6.4% after 5000 cycles of charging and discharging at a current density of 2 A g^{-1} . These findings indicate that the wolfberry branch is a kind of biomass material, especially suitable for the preparation of super-activated carbon.

Keywords: Black wolfberry branches; supercapacitors; electrode materials; electrochemical performance

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