High-performance Activated Carbons Prepared by KOH Activation of Gulfweed for Supercapacitors

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doi: 10.20964/2018.02.08

Received: 26 September 2017 / Accepted: 24 November 2017 / Published: 28 December 2017

Activated carbons with huge specific surface area and developed pore structure are prepared by KOH activation of gulfweed. Six kinds of gulfweed-based activated carbons with different specific surface area are selected to investigate their electrochemical performance and the influence of specific surface area on the electrochemical performance. The electrochemical performance is investigated by galvanostatic charge-discharge and cyclic voltammetry test. The highest gravimetric capacitance is demonstrated by AC₃₁₅₅, and the capacitance value reaches up to 395 F g⁻¹ at the current density 0.05 A g⁻¹ in 6 M KOH. Moreover, a slow fading of capacitance is observed as the current density increase. The capacitance retention is 92% after 10000 cycles at the current density 2.5 A g⁻¹. The gulfweed-based activated carbons demonstrate both excellent high rate capacitive performance and cycle performance.

Keywords: Gulfweed-based activated carbon; Specific surface area; Supercapacitors; Electrochemical performance.

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