Investigation of CA/G/MnO₂ Electrode Composite for Supercapacitors

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In this paper, we have successfully synthesized a cellulose acetate/graphene/MnO₂ (CA/G/MnO₂) composite, which is further employed as an electrode material for supercapacitors. This novel composite material can fully utilize the conductivity of the graphene and the dense internal structure of the cellulose acetate (CA) to increase the specific capacitance of the MnO₂. At the current density of 0.1 A/g, the specific capacitance of the CA/G/MnO₂ composite is 1181 F/g, which is very close to the theoretical capacitance. Moreover, the capacitance of the CA/G/MnO₂ composite finally stabilizes at 93 F/g, after 5000 cycle charge and discharge test under the high current density of 30 A/g. Its capacitance retention rate is 67.4%, which is great higher than the capacitance retention rate of the MnO₂ (44.2%). These results fully indicate that the CA/G/MnO₂ composite has broad application prospects in the field of super capacitor electrode materials.

Keywords: Supercapacitors; Cellulose acetate; Graphene; Electrode materials

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