Supercapacitance Performances of Electrodeposited Nickel Oxide/Graphene Nanocomposite

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In this paper graphene (GR) was obtained by electrochemical reduction of graphene oxide on the surface of nickel foam (NF). Then NiO nanocrystals were obtained on the GR/NF surface by electrochemical method to get NiO/GR/NF electrode, which was characterized by scanning electron microscopy (SEM). Various electrochemical methods such as cyclic voltammetry, AC impedance, constant current charge and discharge were used to test the electrochemical performances of the electrode. The results indicated that the capacitive properties of the composite were improved effectively due to the presence of nanometer-sized NiO and GR, and the specific capacitance of the composite was calculated as 381 mF/cm² at current density of 1 mA/cm². The specific capacitance retention rate of 1000 cycles at high current density was 97.4% with good cycle stability, which indicated that NiO/GR composite could be used as good supercapacitor material.

Keywords: Nickel oxide, Graphene, Nanocomposite, Supercapacitors, Electrochemistry.

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