

Effect of Thermal Annealing on the Electrochemical Capacitive Performance of Reduced Microcrystalline Graphene Oxide

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Microcrystalline graphene oxide (MGO) was reduced by thermal annealing to prepare reduced microcrystalline graphene oxide (RMGO). The produced RMGO was characterized by X-ray diffraction, ultraviolet-visible absorption spectroscopy, Fourier transform infrared spectroscopy and transmission electron microscopy. The results show that the absorption peaks of the oxygen-containing functional groups almost disappear due to the removal of oxygen atoms from the basal plane of graphene oxide in the temperature range of 150-450°C in nitrogen. The electrochemical behaviour of RMGO annealed at different temperature was evaluated by three-electrode cyclic voltammetry and electrochemical impedance spectroscopy. The results show that an obvious increase in specific capacitance and decrease in charge-transfer resistance can be observed for RMGO at the annealing temperature of 250°C.

Keywords: microcrystalline graphene oxide; graphene; thermal reduction; electrochemical properties

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