Short Communication

A comparison of the Electrochemical Properties of graphene/Mn₃O₄ Composites fabricated by two Different Methods

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In this study, graphene/Mn₃O₄ composites were fabricated to improve the specific capacitance of graphene based supercapacitor, using two different simple methods. First, Graphene/Mn₃O₄ composite (GM1) was synthesized through deposition of nanoscale manganese oxide on the surface of graphene under microwave irradiation. Second, a two-step method consisting of mixing and annealing was employed to fabricate graphene/Mn₃O₄ composite (GM2). The prepared materials were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) and Fourier transform infrared spectroscopy (FT-IR). The XRD analysis revealed the formation of graphene/Mn₃O₄. Moreover, the presence of Mn₃O₄ and MnO₂ was confirmed using Fourier transform infrared spectroscopy. GM2 electrode showed better electrochemical performance, and exhibits the largest specific capacitance of approximately 100 F/g at the scan rate of 30 mV/s in 1 M H₂SO₄ electrolyte. In addition, other electrochemical measurements of the electrodes were implemented proposing that the graphene/Mn₃O₄ composite electrodes are promising materials for supercapacitor application.

Keywords: Graphene, Mn₃O₄, Composites, supercapacitor

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