Abstract

In this research work, $CuFe_2O_4$ /rGO will be synthesized using hydrothermal method.Graphene is a 2D thin atomic atomic layer film of nanostructure, in the last decade, it has attracted a lot of attention of researchers because of its high electron mobility, heat conductivity ,excellent electrical conductivity and high surface area. Such rare properties make graphene to most suitable material for the energy storage applications. Fabrication of metal oxide (MO) with reduced graphene oxide(rGO) is efficient to make an electrode material which enhanced the performance of the SCs. To overcome energy crisis and power shortage ultimately energy storage devices are good solution. To fulfill the such requirements, new lightweight nanomaterials being used. Here, we account the synthesis of new class of nanohybrids $CuFe_2O_4$/ rGO as an electrode materials for supercapacitive measurements. The electrochemical properties were analyzed in three-electrode system such as cyclic voltammetry (CV) and the galvanostatic charge-discharge(GCD) and finaly EIS methods using 1M HCl electrolyte solution. Such enhanced electrochemical performance of MO / rGO electrode is attributed to high transportation of ions into electrode material due to rGO. Structural morphology of nanocomposites were examined by using the Raman spectroscopy, XRD, and surface morphology is studied using Scanning electron microscopy(SEM). rGO/$CuFe_2O_4$ nanocomposite shows high specific capacitance using CV of 920F g^{-1} at 20 mV s^{-1} taking potential window from 0 to 0.5 V. Electrochemical performance of rGO/$CuFe_2O_4$ nanocomposites being enhanced by the well incorporation of $CuFe_2O_4$ nanoparticles in rGO sheets and it is a potential candidate in energy storage devices.