

Synthesis of rGO/CoFe₂O₄ Nanocomposite For Supercapacitor Application

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Received: 15.07.2023 ; Accepted : 27.08.2023

Abstract. In this study, we have synthesized the composite of Reduced Graphene Oxide (rGO) with cobalt ferrites due to the presence of multiple oxidation states of cobalt ions that enhance the properties. The presence of rGO in cobalt ferrite also enhances the surface area and porous structure leading to enhanced electro- chemical properties for supercapacitor application. These properties include high specific capacitance (CS) and long cyclic stability. Here, the composite of rGO/cobalt ferrite (rGO/CoFe₂O₄) was prepared by microwave synthesis method and characterization techniques like X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and Fourier Transformed Infrared Spectroscopy (FTIR) gave us the information of structural/ morphological and chemical compositions of rGO/CoFe₂O₄. The XRD peaks confirmed the formation of a single phase of CoFe₂O₄ and we have calculated the crystallite size which was found to be 11nm. The nanorods like structure appeared in the Scanning Electron Micrograph. Furthermore; we have done the electrochemical property measurement which gives us the specific capacitance of about 16.434 Fg⁻¹ by performing cyclic voltammetry at scan rate 5mV s⁻¹ and for other scan rates we got different values of specific capacitance.

Keywords: Reduced graphene oxide, cobalt ferrite, supercapacitor, electrochemical properties