

Abstract

Nowadays, composites of transition metal oxides and carbon-based materials have drawn the focus of researchers as electrode materials for supercapacitors. In the present work, the hydrothermal method synthesized Magnesium Cobaltite (MgCo_2O_4) and Magnesium Cobaltite anchored with CNTs (MgCo_2O_4 -CNTs). X-ray diffraction (XRD) revealed that MgCo_2O_4 has a spinel cubic structure. Scanning Electron Microscope (SEM) observed rod-like structures of the prepared composites. Fourier Transform Infrared spectroscopy (FTIR) revealed the functional groups present in the material. Electrochemical properties have been investigated at the potentiostat workstation. MgCo_2O_4 exhibited specific capacitance 344 Fg^{-1} at current density 1 Ag^{-1} . The addition of CNTs appreciably enhanced the electrochemical performance MgCo_2O_4 -CNTs. MgCo_2O_4 -CNTs demonstrated a specific capacitance of 824.9 Fg^{-1} at 1 Ag^{-1} , which is much higher as compared to the specific capacitance of pure MgCo_2O_4 . The energy density of MgCo_2O_4 -CNTs reached 28.6 Whkg^{-1} at a power density of 250 Wkg^{-1} , highlighting its importance in being utilized as electrode material for supercapacitor application.