Abstract

Nickel oxide based material was prepared as a candidate for supercapacitor application. In this study, we employed the solution combustion method for synthesize of Ni_2O_3, Bi@NiO and Bi@ Ni_2O_3/GO nanomaterial. Various analytical techniques, including X-ray diffraction (XRD), diffuse reflectance spectroscopy (DRS), Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM), were employed to investigate the structural characteristics, chemical bonding, and mþrphology of the prepared materials. All the samples exhibited a hexagonal crystalline structure, as confirmed by XRD analysis. For the electrochemical assessment, we immobilized all the synthesized materials onto nickel foam, with NiO nanoparticles being deposited on the nickel foam substrate using polyvinylidene fluoride (PVdF) as a binder. Electrochemical properties were evaluated using cyclic voltammetry (CV), galvanic charging-discharging (GCD). The results indicate that Bi@NiO/GO nanomaterial exhibited the highest specific capacitance of 127 F/g at 5 mV/s among all the tested samples.