

Porous nanostructured $\text{Co}_3\text{O}_4/\text{NiO}$ composite electrode for Supercapacitors

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Nanostructured cobalt-nickel oxides composite thin film electrodes on copper substrates were prepared by the chemical bath deposition route. The surface morphology and structure of the composite were characterized by scanning electron microscopy and X-ray diffraction, respectively. Cyclic voltammetry, impedance spectroscopy and galvanostatic charge/discharge measurements were applied to investigate the electrochemical performance of the composite electrodes with different potentials. When the mass ratio of Co and Ni in composite material was 50:50, the specific capacitance of $\text{Co}_3\text{O}_4/\text{NiO}$ calculated from the cyclic voltammetry curve was 426 F/g, in 2 M KOH electrolyte at scan rate of 20 mV/s. The specific capacitance of $\text{Co}_3\text{O}_4/\text{NiO}$ electrode was much larger than that of each pristine component. Electrochemical impedance spectra (EIS) investigation illustrated that the capacitance of the test electrode was mainly consisted of pseudo-capacitance. Moreover, the composite electrodes showed that specific energy, specific power and energy efficiency were 20 Wh/kg, 1.3 kW/kg and 87.5 %, respectively.