Short Communication

One-Step Hydrothermal Synthesis of Nickel/Cobalt Double Hydroxide Composite Containing Reduced Graphene Oxide as High Performance Electrode Material for Supercapacitor

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Nickel/cobalt double hydroxide composite containing reduced graphene oxide (Ni/Co-DH-RGO) with high electrochemical performances has been prepared by hydrothermal one-step method accompanied with using hexamethylene tetramine (HMT) as homogeneous precipitating agent and its hydrolysis product for reducing graphene oxide. X-ray diffraction pattern displays that Ni/Co-DH-RGO exists as a composite of α -Ni(OH)₂- β -Co(OH)₂ and reduced graphene oxide. Infrared spectrum shows that the typical peaks of carboxyl and epoxy group in graphene oxide are significantly weakened after the hydrothermal reaction. Scanning electron microscope image shows Ni/Co-DH-RGO takes on hierarchical morphology. The as-prepared Ni/Co-DH-RGO has a specific capacitance of 2120 F g⁻¹ at a current density of 1 A g⁻¹ and 1569.8 F g⁻¹ at the current density of 8 A g⁻¹.

Keywords: Hydrothermal one-step synthesis; Hexamethylene tetramine; Nickel/cobalt double hydroxide composite; supercapacitor; electrode material.

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