Synthesis of Graphene/Ni(OH)₂ Composite with Excellent Pseudocapacitive Performance

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Sandwich structure graphene/Ni(OH)₂ composites with super pseudocapacitive performance are obtained by one-pot hydrothermal method. Thermogravimetry and differential scanning calorimetry (TG–DSC), X-ray diffraction (XRD) analysis, Scanning electron microscopy (SEM), Fourier transformed infrared spectroscopy (FTIR), Raman spectroscopy (Ram) and Transmission electron microscopy (TEM) are used to determine the structure and morphology of the composites. It is interesting that the C : Ni ratio plays an important role on the composite's capacitive performance. The specific capacitance is 2256 F g⁻¹ at 6M KOH solution when the ratio of C:Ni is 1:7. 93% specific capacitance is remained after 7000 cycles, which exhibits its superior cycle stability. This reflects that sandwich structure graphene/Ni(OH)₂ materials are promising for energy storage applications.

Keywords: Graphene; Ni(OH)₂; Sandwich structure; Capacitance performance

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