In Situ Growth of Redox–Active Iron–Centered Particles On Graphene Sheets for Specific Capacitance Enhancement

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ABSTRACT

A fast and facile approach is proposed to enhance the specific capacitance of *N*-Methyl-2-pyrrolidone (NMP)–exfoliated graphene. Redox–active nickel ferricyanide (NiFeCN) nanoparticles were grown on the surface of graphene sheets using a simple co–precipitation method. Apart from the synergetic effect of graphene as double layer capacitance and NiFeCN as pseudocapacitance in specific capacitance enhancement, the NiFeCN nanoparticles served as the spacer to prevent the graphene sheets agglomeration. The NiFeCN/graphene exhibited specific capacitance of 113.5 F g^{-1}, which was 2 times higher than the NMP–exfoliated graphene (52 F g^{-1}) and 6 times higher than the pure NiFeCN (18 F g^{-1}). The findings suggested the NiFeCN/graphene could be the potential candidate for supercapacitors electrode.

KEYWORDS: Supercapacitor; Nanoparticles; Iron; Electrochemical Double Layer Capacitance;Pseudocapacitance

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