Design and Synthesis of Ternary Graphene/Polyaniline/Co₃O₄ Hierarchical Nanocomposites for Supercapacitors

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Graphene/polyaniline/Co₃O₄ ternary composites were synthesized by a facile route using graphene oxide/polyaniline (GO/PANI) and cobalt salts as raw materials through hydrothermal treatment. The composites prepared by the novel two-step method presented an interconnected lamella structure in which the Co₃O₄ nanoparticles uniformly dispersed on the ultrathin graphene nanosheets, and exhibited an outstanding performance with large specific capacitance of 789.7 F g⁻¹ at a current density of 1 A g⁻¹. Furthermore, their capacitance retained 81.8% at 10 A g⁻¹ for 1000 cycles, which indicated it could be a promising supercapacitor with a superior capacitance and cycling stability.

Keywords: Supercapacitors, Graphene, PANI, Co₃O₄, Two-step method

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