## Hydrothermal Synthesis of N-Doped Graphene/Fe<sub>2</sub>O<sub>3</sub> Nanocomposite for Supercapacitors

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A facile hydrothermal method for synthesizing N-doped graphene/Fe<sub>2</sub>O<sub>3</sub> nanocomposite and its application to supercapacitors is demonstrated. The combination of large theoretical specific conductance of  $Fe_2O_3$  with the high conductivity of N-doped graphene resulted in excellent capacitance values and high-rate performance. N-doped graphene offered lower charge transfer resistance as well as better wettability between the graphene and the electrolyte. This increased the ion diffusion rate and accessible surface area. Samples prepared with and without N-doping were characterized and their electrochemical performances compared. N-doping increased the specific capacitance at 1 A/g from 543 F/g to 698 F/g. A capacitance as high as 354 F/g was retained when the current density was raised to 20 A/g.

Keywords: graphene, nitrogen doping, hydrothermal, iron oxide, supercapacitor.

## FULL TEXT

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