Facile Synthesis Of Fe₂O₃ Nanospheres Anchored On Oxidized Graphitic Carbon Nitride as a High-Performance Electrode Material for Supercapacitors

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doi: 10.20964/2020.03.54

Received: 9 November 2019 / Accepted: 23 December 2019 / Published: 10 February 2020

Fe₂O₃, which shows promise as an abundant and low-cost electrode material for supercapacitors has attracted much attention due to its high theoretical specific capacity. In this report, homogeneous Fe₂O₃ nanospheres/oxidized g-C₃N₄ (Fe₂O₃/OCN) are synthesized by anchoring Fe₂O₃ nanospheres on the surface of oxidized g-C₃N₄ for the first time via a facile hydrothermal method. More importantly, these Fe₂O₃ nanospheres are well-dispersed on the oxidized g-C₃N₄ layers, which can offer an abundance of active sites and effectively prevent the aggregation of Fe₂O₃ nanospheres during electrochemical reactions. Moreover, 10% OCN/Fe₂O₃ exhibits excellent electrochemical performance with an excellent specific capacitance of 243 F g⁻¹ at a current density of 1 A g⁻¹, which is better than that of pure Fe₂O₃ nanospheres. Moreover, there is no obvious capacitance decrease after 1000 cycles. Therefore, Fe₂O₃/OCN is demonstrated to be an excellent electrode material for supercapacitors.

Keywords: Fe₂O₃ nanospheres; Oxidized graphitic carbon; Electrode material; supercapacitor

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