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Self-assembly of Fe₂O₃/ordered mesoporous carbons for high-performance lithium-ion batteries

Liying Kang ^a, Zhenglong Yang ^{a,*}, Yanbin Xu ^a, Wei Jiang ^a, Feng Wang ^a, Yanfeng Meng ^a, Na Liu ^a, Fenghua Liu ^a, Shujiang Ding ^{b,*}

^a School of Chemistry and Materials Science, Ludong University, Yantai 264025, China

^b MOE Key Laboratory for Nonequilibrium Synthesis and Modulation of Condensed Matter and Department of Applied Chemistry, School of Science, Xi'an Jiaotong University, Xi'an 710049, China

* Corresponding authors.

E-mail addresses: yzl@iccas.ac.cn (Z. Yang), dingsj@mail.xjtu.edu.cn (S. Ding).

Abstract

Fe₂O₃/ordered mesoporous carbons (OMCs) have been synthesized by a facile one-pot hydrothermal method via self-assembly process. The combination of OMCs and anchored Fe₂O₃ nanoparticles shows a synergistic effect which results in a kind of anode materials with enhanced electrochemical performance for lithium ion batteries. OMCs with highly porous mesostructure and good conductivity not only alleviate the problem of volume variation and agglomeration of Fe₂O₃, but shorten the diffusion pathway of Li⁺ ions, which efficiently overcomes the problem of rapid capacity loss of iron oxide. Moreover, appropriate loading amount of Fe₂O₃ nanoparticles is believed to be a key factor to enhance the capacity of anode materials. The materials deliver an excellent reversible capacity of 789 mAh g⁻¹ at a current density of 100 mA g⁻¹ after 120 cycles.

Keywords

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