Fabrication of Hollow MgFe_2O_4 Microspheres for High Performance Anode of Lithium Ion Battery

Wenhui Liu, Riya Jin, Yunlu Li, yuanyuan Wu, Xiong Cao, Shuangqi Hu*

Environmental and Safety Engineering Institute, North University of China, Taiyuan, Shanxi 030051, People's Republic of China

*E-mail: hsq@nuc.edu.cn

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In this work, spinel MgFe_2O_4 hollow structural microspheres were fabricated through an environmental friendly hydrothermal carbon templating approach with subsequently annealing process in air, where carbon spheres plays as template to create void space, and that promote metal source loading into colloidal carbon sphere. The resultant hollow MgFe_2O_4 sphere possess excellent textural properties of a large void space size (50-80nm) and tailored shell thickness(25-35nm). The spinel MgFe_2O_4 hollow structural microspheres used as an anode material for rechargeable lithium-ion battery possesses a high initial discharge specific capacity of 616.3 mAh g^{-1} at a stable current density of 500 mAh g^{-1} and the capacity retention of 559.9 mAh g^{-1} by 18 cycles. The excellent electrochemical performances of the spinel MgFe_2O_4 hollow structural microspheres may be associated with the special porous hollow structures, which deliver an easy Li^+ diffusion pathway and facilitate charge transfer and alleviate the volume variation and diminishes polarization in cycling.

Keywords: Hollow microspheres; Magnesium ferrite; Photocatalytic material; Hydrothermal

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