Sulfur Substituted LiFePO_4/C with Improved Rate Performance for Lithium Ion Batteries

Tao Yu⁺, Zhao Wang⁺, Yao Fu, Yachao Xiong, Shiyong Guan^{*}

School of Materials Science and Engineering, East China University of Science and Technology, Mei Long Road 130, Shanghai 200237, P.R. China

[+] These authors contributed equally to this work.

*E-mail: syguan@ecust.edu.cn

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Sulfur substituted LiFePO_4/C sample was successfully synthesized by solid state method. The importation of sulfur ion can slightly increase the lattice parameters of LiFePO_4 while maintaining the original orthorhombic olivine structure. Electrochemical tests show the rate capacity of sulfur substituted LiFePO_4/C was significantly improved comparing with LiFePO_4/C . The improvement of the rate performance is attributed to the importation of sulfur ion which may expand the Li^+ ion diffusion pathway to facilitate charge transfer and Li^+ ion diffusion. The results indicate that sulfur substitution can be an effective approach to improve the electrochemical performance of LiFePO_4/C cathode materials for lithium ion batteries.

Keywords: Sulfur substitution; Lithium iron phosphate; Solid state reaction; Rate performance.

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