Rational Design of Hierarchical MnO@N-doped Carbon Nanowires as a High-Performance Anode for Lithium-Ion Batteries

Xiaoming Xu^{*}, Renzheng Li, Huanhuan Li, Donghai Hu, Jiaqi Fu

School of Automotive and Traffic Engineering, Jiangsu University, Zhenjiang, China, 212013

^{*}E-mail: xuxiaoming3777@163.com

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A facile synthesis strategy for hierarchical MnO@N-doped carbon nanowires was developed using a single in situ pyrolysis of Mn-based coordination polymers. Core-shell MnO@N-doped carbon building blocks are interconnected into a mesoporous nanowire. The artificial nanocomposite facilitates fast transport of Li⁺ ions and electrons and buffers the MnO volume change during Li insertion/extraction processes. As a consequence, hierarchical MnO@N-doped carbon nanowires display a promising electrochemical performance, such as a high reversible capacity, excellent cycling stability and rate capability, as an anode material for lithium-ion batteries.

Keywords: MnO; N-doped carbon; anode material; lithium-ion battery; energy storage and conversion

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