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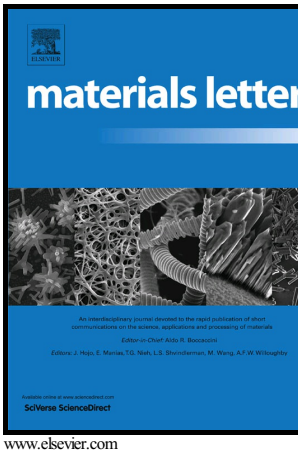

PII: S0167-577X(15)30494-8
DOI: http://dx.doi.org/10.1016/j.matlet.2015.08.137
Reference: MLBLUE19498

To appear in: *Materials Letters*

Received date: 13 May 2015
Revised date: 23 July 2015
Accepted date: 27 August 2015

Cite this article as: Xiaodong Shi, Zhian Zhang, Yun Fu and Yongqing Gan, Self-template synthesis of nitrogen-doped porous carbon derived from zeoliti imidazolate framework-8 as an anode for sodium ion batteries, *Materials Letters* http://dx.doi.org/10.1016/j.matlet.2015.08.137

Self-template synthesis of nitrogen-doped porous carbon derived from zeolitic imidazolate framework-8 as an anode for sodium ion batteries

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Abstract: Nitrogen-doped porous carbon (NPC) was successfully synthesized with zeolitic imidazolate framework-8 (ZIF-8) as the precursor at a high carbonization temperature of 950 ℃, which can generate relatively pure NPC. When used as the anode materials for sodium ion batteries, the NPC exhibits an excellent rate capability and cycling stability, delivering a reversible capacity of 144.7 mA h g^{-1} at a current density of 50 mA g^{-1} after 200 cycles and a capacity of 117.6 mA h g^{-1} at a high current density of 400 mA g^{-1}, which is attributed to the existence of mesoporous structure and the introduction of nitrogen atoms. The electrochemical results indicate the NPC is a promising electrode material for sodium ion batteries.

Keywords: porous carbon, anode materials, self-template synthesis, sodium ion batteries

1. Introduction

In recent decades, lithium ion batteries (LIBs) have been widely applied in portable electronic devices [1, 2]. However, large scale commercial applications of LIBs were limited by relatively high cost and finite reserves of lithium [3]. In view of the similar physical/chemical properties of sodium with lithium, sodium ion batteries (SIBs) have gained recognition as the promising alternative to LIBs for their potential cost advantage, and abundant reserves [4, 5]. Nevertheless, the practical implementation of SIBs is hindered by low energy density and poor cycling stability. The poor cycle life is attributed to the larger

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