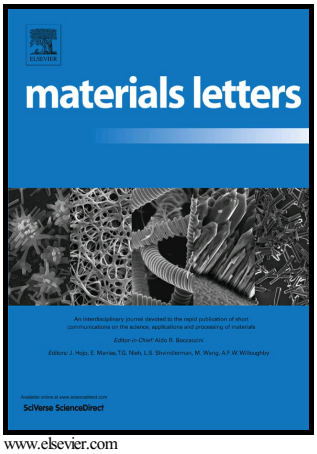

Facile Synthesis of Hierarchical Porous Carbon for Supercapacitor with enhanced Electrochemical Performance

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PII: S0167-577X(16)31001-1
DOI: http://dx.doi.org/10.1016/j.matlet.2016.06.046
Reference: MLBLUE21047

To appear in: *Materials Letters*

Received date: 3 December 2015
Revised date: 31 May 2016
Accepted date: 11 June 2016

Cite this article as: Zhongrong Geng, Hao Wang, Rutao Wang, Peng Zhang, Junwei Lang and Chengbing Wang, Facile Synthesis of Hierarchical Porous Carbon for Supercapacitor with enhanced Electrochemical Performance *Materials Letters,* http://dx.doi.org/10.1016/j.matlet.2016.06.046

Facile Synthesis of Hierarchical Porous Carbon for Supercapacitor with enhanced Electrochemical Performance

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ABSTRACT: Herein, we use a facile one-pot strategy to synthesis hierarchical porous carbon from sodium alginate (SA). After pre-conditioned at 200 ℃, SA was activated by a small amount of NaOH at 800 ℃. In the sintering process, the SA can achieve a self-activation effect which can effectively reduce the dosage of alkaline activator (in a weight ratio of 5:4) during activating process. Finally, the end product exhibits a capacity of 451 F/g in 2 M KOH aqueous solution and exhibit excellent rate ability. The cycle ability of OSADC-5 was tested at 10 A/g, and after 10,000 cycles the capacitance retention is 99％ which shows superb electrochemistry stability.

Keywords: Carbon materials, Energy storage and conversion, Porous materials, sodium alginate

1. Introduction

During the past decades, carbon based supercapacitors (SCs) have caused tremendous interest due to their unique properties: high power density, excellent cycle stability and superior safety in extreme conditions, but undergo low energy density [1, 2]. To overcome this shortage, most of the efforts have been focused on developing novel carbon materials to improve the energy density of SCs [3, 4].

In carbon based SCs, the energy storage process occurs when the ions accumulate on the interface of electrode/electrolyte. Thus, the pore structure of porous carbon (PC) affects the performance of capacitors