A Facile Route for Preparation of High-Performance Hierarchical Porous Carbons for Supercapacitor Electrodes

Lili Wang^{*}, Miaomiao Jia, Wenqi Lu, Kunlong Yang, Junqin Fan, Gang Liao, Jianguo Yu^{*}

College of Environment and Chemical Engineering & State Key Laboratory of Hollow-Fiber Membrane Materials and Membrane Processes, Tianjin Polytechnic University, Tianjin 300387, PR China
College

^{*}E-mail: wanglili09.29@163.com, hh_y1118@hotmail.com

doi: 10.20964/2016.07.27

Received: 31 March 2016 / Accepted: 7 April 2016 / Published: 4 June 2016

In this work, a facile route for preparation of high-performance hierarchical porous carbons from starch was described. The hierarchical porous carbons with developed micropores and mesopores were prepared, and the pore size was distributed at 2, 9 and 13 nm. The high-performance porous carbons with specific capacity of 221 F/g was obtained when the mass ratio of starch to zinc nitrate was 1:1 and the carbonization temperature was 800 °C. It also possessed excellent specific capacitance retention about 96.4 % of the initial value even after 5000 cycles, and the higher capacitance retention of 88.7% was obtained when the current density changing from 0.2 to 2 A/g. The pore structure and the electrochemical performance could be tuned by changing the reaction conditions. The experimental results suggested the hierarchical porous carbons could be an ideal candidate for supercapacitor applications.

Keywords: Starch, Hierarchical porous carbons, Supercapacitor, Specific capacity

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