

## Accepted Manuscript

Carbon Aerogel-based Supercapacitors Modified by Hummers Oxidation Method

Yuelong Xu, Bin Ren, Shasha Wang, Lihui Zhang, Zhenfa Liu

PII: S0021-9797(18)30501-0  
DOI: <https://doi.org/10.1016/j.jcis.2018.04.108>  
Reference: YJCIS 23573

To appear in: *Journal of Colloid and Interface Science*

Received Date: 21 March 2018  
Revised Date: 20 April 2018  
Accepted Date: 28 April 2018

Please cite this article as: Y. Xu, B. Ren, S. Wang, L. Zhang, Z. Liu, Carbon Aerogel-based Supercapacitors Modified by Hummers Oxidation Method, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.04.108>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Carbon Aerogel-based Supercapacitors Modified by Hummers Oxidation Method

Yuelong Xu<sup>a,b</sup>, Bin Ren<sup>a,b</sup>, Shasha Wang<sup>a,b,c</sup>, Lihui Zhang<sup>a,b</sup>, Zhenfa Liu<sup>a,b,c\*</sup>

a Institute of Energy Resources, Hebei Academy of Sciences, Shijiazhuang 050081, China

b Hebei Engineering Research Center for Water Saving in Industry, Shijiazhuang 050081, China

c School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin 300000, China

E-mail addresses: xudalong.cool@163.com (Y. Xu), RENBINTS@126.com (B. Ren), wssnys@126.com (S. Wang), zlhkxy@126.com (L. Zhang), lzf63@sohu.com (Z. Liu)

\* Corresponding author at: Institute of Energy Resources, Hebei Academy of Sciences,

Shijiazhuang 050081, China.

E-mail address: lzf63@sohu.com (Z. Liu).

## Abstract

Carbon aerogels of an inter-connected three-dimensional (3D) structure are a potential carbon material for supercapacitors. We report a new oxidation modification method to prepare a series of modified carbon aerogels (OM-CA) by Hummers oxidation method. Oxidation-modified carbon aerogels (OM-CA) are obtained from carbon aerogel powders oxidized by Hummers method. Sulfuric acid stoichiometry is studied in order to investigate the effect of the surface oxygen group on surface area and electrochemical performance. Additionally, heteroatoms are doped into carbon aerogels in the oxidation process. The effect of heteroatom doping on electrochemical performance as a supercapacitor electrode material is investigated. When the amount of sulfuric acid is 40 wt%, the doping manganese content is 0.9 mol%, the specific surface area of OM-CA is 450 m<sup>2</sup>/g, and its specific capacitance is 151 F g<sup>-1</sup> at 0.5 A g<sup>-1</sup>, which is achieved by heteroatom doping and texture properties. In addition, OM-CA composite supercapacitors exhibit a stable cycle life at a current density of

Download English Version:

<https://daneshyari.com/en/article/6990216>

Download Persian Version:

<https://daneshyari.com/article/6990216>

[Daneshyari.com](https://daneshyari.com)