

Accepted Manuscript

In situ Surface Decoration of Fe₃C/Fe₃O₄/C Nanosheets: Towards Bi-functional Activated Carbons with Supercapacitance and Efficient Dye Adsorption

Lei Yao, Jiajia Yang, Peixin Zhang, Libo Deng

PII: S0960-8524(18)30201-3

DOI: <https://doi.org/10.1016/j.biortech.2018.02.027>

Reference: BITE 19536

To appear in: *Bioresource Technology*

Received Date: 9 December 2017

Revised Date: 4 February 2018

Accepted Date: 5 February 2018



Please cite this article as: Yao, L., Yang, J., Zhang, P., Deng, L., In situ Surface Decoration of Fe₃C/Fe₃O₄/C Nanosheets: Towards Bi-functional Activated Carbons with Supercapacitance and Efficient Dye Adsorption, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.02.027>

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.

In situ Surface Decoration of Fe₃C/Fe₃O₄/C Nanosheets: Towards Bi-functional Activated Carbons with Supercapacitance and Efficient Dye Adsorption

Lei Yao^{#1}, Jiajia Yang^{#1}, Peixin Zhang^{1,2} and Libo Deng^{*1}

¹College of Chemistry and Environmental Engineering, Shenzhen University, Shenzhen 518060, China

²Shenzhen Key Laboratory of Environmental Chemistry and Ecological Remediation, Shenzhen University, Shenzhen 518060, P. R. China

#These authors contributed equally to this work.

Abstract

This work reports a bi-functional activated porous carbon (PC) prepared from a biomass tofu, with excellent capacities for charge storage and adsorption of organic dyes, which is enabled by decorating with Fe₃C/Fe₃O₄/C nanosheets. The in-situ growth and self-assembly of the nanosheets on the carbon surface are achieved by a one-step catalytic carbonization of tofu simultaneously with FeCl₃ and ZnCl₂ catalysts. Due to the high surface area and unique iron compounds-containing and sheet-like structures, the PCs exhibit an electrochemical capacitance of 315 F g⁻¹ at 0.5 A g⁻¹ as supercapacitor electrodes, and an ultrahigh adsorption capacity of 918 mg g⁻¹ for methylene blue (MB) and 868 mg g⁻¹ for Rhodamine B (RhB). This study provides a new perspective for understanding the effects of surface engineering on increasing charge storage and dye adsorption ability of biomass-derived PCs as well as for developing bi-functional PCs with novel magnetic properties.

Keywords: Activated carbon; Nanosheets; Supercapacitor; Dye adsorption

1. Introduction

* Corresponding author: Denglb@szu.edu.cn; Tel: +86-755-26536157

Download English Version:

<https://daneshyari.com/en/article/7067812>

Download Persian Version:

<https://daneshyari.com/article/7067812>

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