

Accepted Manuscript

Removal of hexavalent chromium from aqueous solution by different surface-modified biochars: Acid washing, nanoscale zero-valent iron and ferric iron loading

Yuen Zhu, Hua Li, Guixiang Zhang, Fanjian Meng, Lifan Li, Shan Wu

PII: S0960-8524(18)30504-2

DOI: <https://doi.org/10.1016/j.biortech.2018.04.004>

Reference: BITE 19781

To appear in: *Bioresource Technology*

Received Date: 23 January 2018

Revised Date: 30 March 2018

Accepted Date: 1 April 2018

Please cite this article as: Zhu, Y., Li, H., Zhang, G., Meng, F., Li, L., Wu, S., Removal of hexavalent chromium from aqueous solution by different surface-modified biochars: Acid washing, nanoscale zero-valent iron and ferric iron loading, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.04.004>

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.



Removal of hexavalent chromium from aqueous solution by different surface-modified biochars:

Acid washing, nanoscale zero-valent iron and ferric iron loading

Yuen Zhu ^a, Hua Li ^b, Guixiang Zhang ^{c,*}, Fanjian Meng ^b, Lifen Li ^b, Shan Wu ^{d,e}

^a State Key Laboratory of Water Environment Simulation, School of Environment, Beijing

Normal University, Beijing 100875, China

^b School of Environment and Resources, Shanxi University, Taiyuan 030006, China

^c College of Environment and Safety, Taiyuan University of Science and Technology, Taiyuan

030024, China

^d Poyang Lake Key Laboratory of Environment and Resource Utilization (Nanchang University),

Ministry of Education, School of Resource, Environment and Chemical Engineering, Nanchang

University, Nanchang 330031, China

^e Guangdong Institute of Eco-Environmental Science and Technology, Guangzhou 510650, China

Abstract: Willow residue biochar (BC) and modified biochars (hydrochloric acid washing (HBC),

HBC loaded with nanoscale zero-valent iron (nZVI-HBC), and HBC loaded with ferric iron

(Fe³⁺-HBC)) after aging were used for aqueous Cr(VI) removal. HBC (> 98.67%), nZVI-HBC (>

98.86%), and Fe³⁺-HBC (> 99.64%) kept high Cr(VI) removal rates under the acidic conditions

within a wide pH range (< 7.0), indicating their good adaptability to pH change because of aging.

Cr(VI) reduction to Cr(III) was the dominant removal mechanism. The formation of –COOH on

BC, HBC, and nZVI-HBC indicates the oxidation of surface functional groups by Cr(VI) and

simultaneous Cr(VI) reduction. The disappearance of nZVI peaks indicates the reduction of

Corresponding author

E-mail: zhanggx@tyust.edu.cn (G. Zhang)

Download English Version:

<https://daneshyari.com/en/article/7066957>

Download Persian Version:

<https://daneshyari.com/article/7066957>

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