

Accepted Manuscript

Highly efficient removal of trimethoprim based on peroxymonosulfate activation by carbonized resin with Co doping: performance, mechanism and degradation pathway

Yang Liu, Hongguang Guo, Yongli Zhang, Xin Cheng, Peng Zhou, Jing Deng, Jingquan Wang, Wei Li

PII: S1385-8947(18)31803-5
DOI: <https://doi.org/10.1016/j.cej.2018.09.086>
Reference: CEJ 19925

To appear in: *Chemical Engineering Journal*

Received Date: 26 June 2018
Revised Date: 28 August 2018
Accepted Date: 10 September 2018



Please cite this article as: Y. Liu, H. Guo, Y. Zhang, X. Cheng, P. Zhou, J. Deng, J. Wang, W. Li, Highly efficient removal of trimethoprim based on peroxymonosulfate activation by carbonized resin with Co doping: performance, mechanism and degradation pathway, *Chemical Engineering Journal* (2018), doi: <https://doi.org/10.1016/j.cej.2018.09.086>

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.

Highly efficient removal of trimethoprim based on peroxymonosulfate activation by carbonized resin with Co doping: performance, mechanism and degradation pathway

Yang Liu^a, Hongguang Guo^{a, b,*}, Yongli Zhang^a, Xin Cheng^a, Peng Zhou^a, Jing Deng^c, Jingquan Wang^a, Wei Li^a

^a College of Architecture and Environment, Sichuan University, Chengdu 610065, China

^b Department of Civil & Environmental Engineering, University of Washington, Box 352700, Seattle, WA 98195-2700, United States

^c College of Civil Engineering and Architecture, Zhejiang University of Technology, Hangzhou 310014, China

*Corresponding author. Tel: +86-028-85408889; fax: +86-028-85405534

Email: hgguo@scu.edu.cn

Abstract: We first report the syntheses of carbon-supported Co (CS-Co) composite via a carbonization process from a saturated resin. CS-Co exhibited favorable catalysis activities in activation of peroxymonosulfate (PMS) to generate $\cdot\text{SO}_4^-$ and $\cdot\text{OH}$ for trimethoprim (TMP) degradation. The performance of composites were studied with respect to diverse pHs (3.0-9.0), catalyst dosages (0.05-0.5 g/L), PMS dosages (0.05-1.0 mM), TMP concentration (5-20 mg/L) and temperature (15-30°C). Water matrix concerning various levels of humic acid (HA) showed negative effect for TMP removal due to the intrinsic competition between HA. Scavenging test indicated that $\cdot\text{SO}_4^-$ and $\cdot\text{OH}$ were the dominant reactive radicals, and an uncomplicated method to calculate the normalized steady-state concentration of radicals in CS-Co/PMS process was established. The electron transfer concerning PMS, carbon surface and Co^{2+} was attributed as the main activation mechanism. The main intermediate products of TMP were identified by LC/MS/MS technology with four degradation pathways proposed, including hydroxylation, electron transfer mechanism, demethylation and ring-cleavage.

Keywords: cationic resin, carbonation, peroxymonosulfate, mechanism, degradation pathway

Download English Version:

<https://daneshyari.com/en/article/10145227>

Download Persian Version:

<https://daneshyari.com/article/10145227>

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