

Accepted Manuscript

Co-metabolic removal of ciprofloxacin under condition of interaction between microbes and Fe_3O_4

Zhiman Yang, Xiaoshuang Shi, Meng Dai, Lin Wang, Xiaohui Xu, Rongbo Guo

PII: S1385-8947(17)31684-4
DOI: <https://doi.org/10.1016/j.cej.2017.09.177>
Reference: CEJ 17762

To appear in: *Chemical Engineering Journal*

Received Date: 12 June 2017
Revised Date: 26 September 2017
Accepted Date: 27 September 2017

Please cite this article as: Z. Yang, X. Shi, M. Dai, L. Wang, X. Xu, R. Guo, Co-metabolic removal of ciprofloxacin under condition of interaction between microbes and Fe_3O_4 , *Chemical Engineering Journal* (2017), doi: <https://doi.org/10.1016/j.cej.2017.09.177>

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.



Co-metabolic removal of ciprofloxacin under condition of interaction between microbes and Fe₃O₄

Zhiman Yang, Xiaoshuang Shi, Meng Dai, Lin Wang, Xiaohui Xu, Rongbo Guo*, Shandong Industrial Engineering Laboratory of Biogas Production & Utilization, Key Laboratory of Biofuels, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao, Shandong Province 266101, P.R. China

* Corresponding author: guorb@qibebt.ac.cn, Tel. & fax: +86 532 80662708

Abstract: Potential of effluents from biological hydrogen production process to improve ciprofloxacin (CIP) removal was investigated using ciprofloxacin-degrading enrichments in the presence of Fe₃O₄ nanoparticles. Effluent addition clearly promoted CIP removal, which was 61%, 38% and 16% higher than those in the enrichments amended with fecal sewage, biogas digestate and water, respectively. Experiments of sterilization and organic components of effluents indicated that the organic substances served as co-metabolic substrate to facilitate CIP removal, where ethanol was the preferred co-metabolic substrate. Although the effluent addition changed the bacterial community composition which corresponded to the changes in the relative abundances of dominant genera in the enrichments, CIP removal performance remained unchanged. The increased Fe (II) concentrations indicated that there might be a positive relationship of CIP removal with the microbial reduction of Fe (III) to Fe (II) in Fe₃O₄ in the effluents-amended enrichments. It was proposed that the organic substances in the effluents might serve as the co-metabolic substrate to promote CIP removal by CIP-degrading and Fe (III)-reducing bacteria.

Download English Version:

<https://daneshyari.com/en/article/6581081>

Download Persian Version:

<https://daneshyari.com/article/6581081>

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