

Accepted Manuscript

The self-catalysis of ferrate (VI) by its reactive byproducts or reductive substances for the degradation of diclofenac: kinetics, mechanism and transformation products

Junfeng Zhao, Yiqing Liu, Qun Wang, Yongsheng Fu, Xiaohui Lu, Xiaofeng Bai

PII: S1383-5866(17)31988-3
DOI: <https://doi.org/10.1016/j.seppur.2017.10.030>
Reference: SEPPUR 14112

To appear in: *Separation and Purification Technology*

Received Date: 31 July 2017
Revised Date: 14 October 2017
Accepted Date: 16 October 2017

Please cite this article as: J. Zhao, Y. Liu, Q. Wang, Y. Fu, X. Lu, X. Bai, The self-catalysis of ferrate (VI) by its reactive byproducts or reductive substances for the degradation of diclofenac: kinetics, mechanism and transformation products, *Separation and Purification Technology* (2017), doi: <https://doi.org/10.1016/j.seppur.2017.10.030>

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.

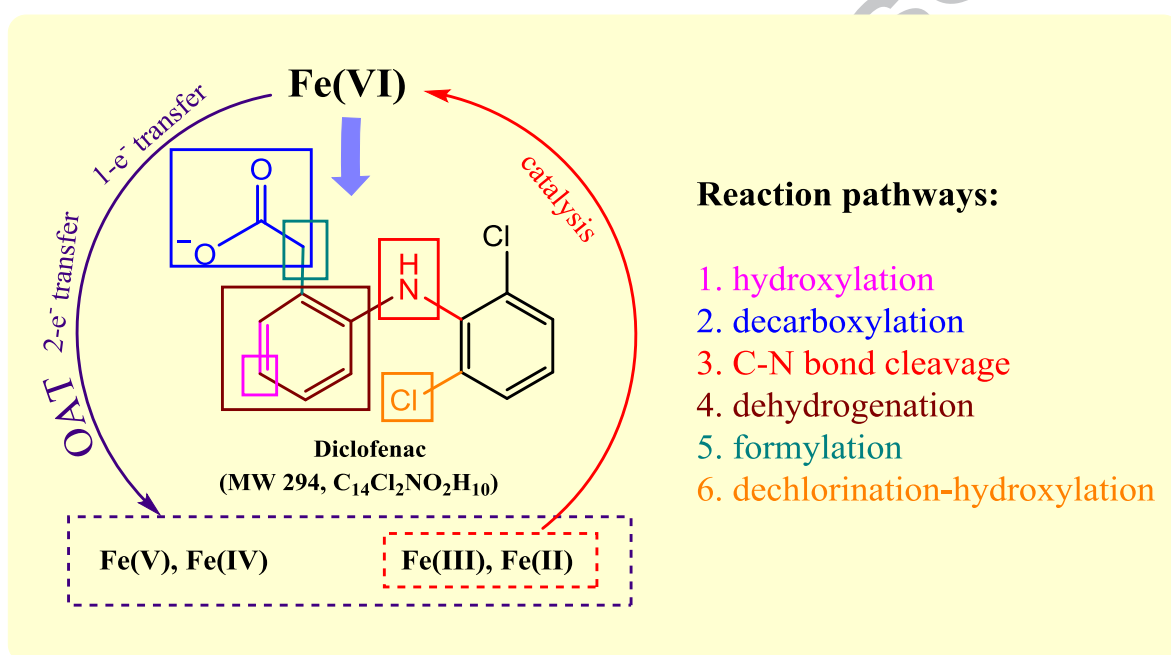


The self-catalysis of ferrate (VI) by its reactive byproducts or reductive substances for the degradation of diclofenac: kinetics, mechanism and transformation products

Junfeng Zhao, Yiqing Liu, Qun Wang*, Yongsheng Fu*, Xiaohui Lu, Xiaofeng Bai

Faculty of Geosciences and Environmental Engineering, Southwest Jiaotong University, Chengdu 611756, China

Graphical Abstract:



Highlights

- Higher DCF removal by Fe(VI) was observed in NaOH system than in phosphate buffer.
- Fe(III) and Fe(II) improved the self-catalysis of Fe(VI) by electron or O transfer.
- Reductive substances (e.g., Mn²⁺ and SO₃²⁻) enhanced the decomposition of Fe(VI).
- Six transformation pathways were proposed based on the identified seven byproducts.

Abstract: In this study, the effect of phosphate, Fe(III), Fe(II), and reductive substances (i.e., Mn²⁺ and SO₃²⁻) on diclofenac (DCF) oxidation and its degradation mechanism by Ferrate (Fe(VI)) were investigated. The removal rate of DCF in reaction solution at pH 9.0 adjusted by NaOH (67.36%) was higher than that by phosphate buffer (14.87%) because of the complexation of phosphate with Fe(III) and/or Fe(II) restraining the self-catalysis of Fe(VI). Fe(III) or Fe(II) could significantly catalyze Fe(VI) to generate more intermediates (i.e., Fe(V) and Fe(IV)), whose oxidation capacity was magnitude stronger

Download English Version:

<https://daneshyari.com/en/article/7044169>

Download Persian Version:

<https://daneshyari.com/article/7044169>

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