

Accepted Manuscript

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PII: S1385-8947(16)31899-X

DOI: <http://dx.doi.org/10.1016/j.cej.2016.12.126>

Reference: CEJ 16291

To appear in: *Chemical Engineering Journal*

Received Date: 24 September 2016

Revised Date: 3 December 2016

Accepted Date: 28 December 2016

Please cite this article as: M. Li, X. Yang, D. Wang, J. Yuan, Enhanced oxidation of Erythromycin by persulfate activated iron powder - H_2O_2 system: Role of the surface Fe species and synergistic effect of hydroxyl and sulfate radicals, *Chemical Engineering Journal* (2016), doi: <http://dx.doi.org/10.1016/j.cej.2016.12.126>



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**Enhanced oxidation of Erythromycin by persulfate activated
iron powder - H₂O₂ system: Role of the surface Fe species and
synergistic effect of hydroxyl and sulfate radicals**

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Abstract: Erythromycin (ERY) is one of macrolide antibiotics which are hardly removed by conventional water treatment process. In this study, the degradation of ERY using a H₂O₂ and persulfate combined process was assessed. Neutral and acidic conditions are superior to alkaline condition in the results of ERY degradation. The Cl⁻ exhibited dual effects (favorable or adverse) distinctively on ERY degradation, while HCO₃⁻, CO₃²⁻ and humic acid significantly inhibited ERY degradation. The results showed that with the persulfate/H₂O₂ molar ratio improved from 0:10 to 1:9 (total oxidants dosage was 0.1 mM), the ERY degradation efficiency increased from 6.5% to 90.0%. Effective oxidation of ERY only occurred after adding persulfate with the formation of surface-associated Fe(II) on the ZVI surface facilitating rapid and extensive decomposition of H₂O₂. Undetectable concentration of dissolve Fe²⁺ suggested that the generation of HO• was mainly from the surface-located

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