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Degradation of tetracycline in a schorl/H_2O_2 system: proposed mechanism and intermediates

Yihan Zhang [a]，Jing Shi [a]*，Zhengwen Xu [b]，Yue Chen[a]，Duanmei Song[a]

[a]*School of Engineering, China Pharmaceutical University, Nanjing 211198, People's Republic of China*

[b]*School of Environment, Nanjing University of Information Science & Technology, Nanjing 210044, People's Republic of China*

Abstract

Schorl could perform as an extremely promising catalyst for decomposing tetracycline hydrochloride (TC) due to its high degradation efficiency, low cost, chemical stability, easy recovery and repeatable utilization. Comparisons of TC degradation indifferent systems showed that schorl/H_2O_2 system exhibited the optimum pollutant elimination and TOC removal efficiencies. Kinetics and possible mechanisms of TC degradation were clarified. The ·OH generated on the schorl surface and $O_2^{-\cdot}$/HO_2·were the main reactive species responsible for TC oxidation. Six possible intermediates were identified, and possible transform mechanisms and pathways were explored. Active radicals were inclined to attack the C=C double bond, dimethylamino and phenolic moieties of TC molecular. The principal intermediate products were generated through N-demethylation, oxidation and rearrangement.

Keywords：Heterogeneous Fenton; Intermediates; Kinetics; Schorl; Tetracycline

1. Introduction