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Colloids and Surfaces A: Physicochemical and Engineering Aspects

Volume 581, 20 November 2019, Article number 123845

## 1D/2D MnWO<sub>4</sub> nanorods anchored on g-C<sub>3</sub>N<sub>4</sub> nanosheets for enhanced photocatalytic degradation ofloxacin under visible light irradiation(Article)

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### Abstract

Herein, MnWO<sub>4</sub> nanorods coupled with g-C<sub>3</sub>N<sub>4</sub> nanosheets were fabricated by a simple hydrothermal method, followed by an ultrasonication method. Morphological features, chemical composition, optical properties and crystallographic information of the prepared materials were obtained using SEM-EDX, TEM, XRD, XPS, FT-IR, UV-vis DRS, and PL techniques. The synthesized MnWO<sub>4</sub>@g-C<sub>3</sub>N<sub>4</sub> nanocomposite displayed excellent photocatalytic activity towards ofloxacin (OFX) under visible light irradiation. Moreover, the influence of reaction parameters such as the catalyst dosage, pollutant concentration and presence of inorganic anions (Cl<sup>-</sup>, CO<sub>3</sub><sup>2-</sup> and SO<sub>4</sub><sup>2-</sup>), was investigated during the photocatalytic process. Notably, among the inorganic anions, SO<sub>4</sub><sup>2-</sup> and CO<sub>3</sub><sup>2-</sup> significantly hampered OFX degradation, while Cl<sup>-</sup> ions showed minimal effect on the degradation process. The apparent rate constant for MnWO<sub>4</sub>@g-C<sub>3</sub>N<sub>4</sub> from first order kinetics was 3.5 and 4.8 times higher than that of pure g-C<sub>3</sub>N<sub>4</sub> and MnWO<sub>4</sub>, respectively. Based on the obtained results, the possible charge transfer mechanism was proposed. The enhanced photocatalytic performance of the binary nanocomposite could be ascribed to the synergistic effect between MnWO<sub>4</sub> nanorods and g-C<sub>3</sub>N<sub>4</sub> nanosheets resulting in efficient visible light utilization and inhibition of the charge carrier recombination. This work demonstrates the potential application of MnWO<sub>4</sub>@g-C<sub>3</sub>N<sub>4</sub> nanostructures in the photocatalytic removal of emerging pollutants in water. © 2019 Elsevier B.V.

### Author keywords

[Emerging pollutants](#) [MnWO<sub>4</sub>@g-C<sub>3</sub>N<sub>4</sub>](#) [Ofloxacin](#) [Photocatalysis](#) [Water treatment](#)

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## Chemicals and CAS Registry Numbers:

ofloxacin, 82419-36-1

**ISSN:** 09277757

**CODEN:** CPEAE

**Source Type:** Journal

**Original language:** English

**DOI:** 10.1016/j.colsurfa.2019.123845

**Document Type:** Article

**Publisher:** Elsevier B.V.

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