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Authors: Amir Mirzaei, Zhi Chen, Fariborz Haghighat, Laleh Yerushalmi

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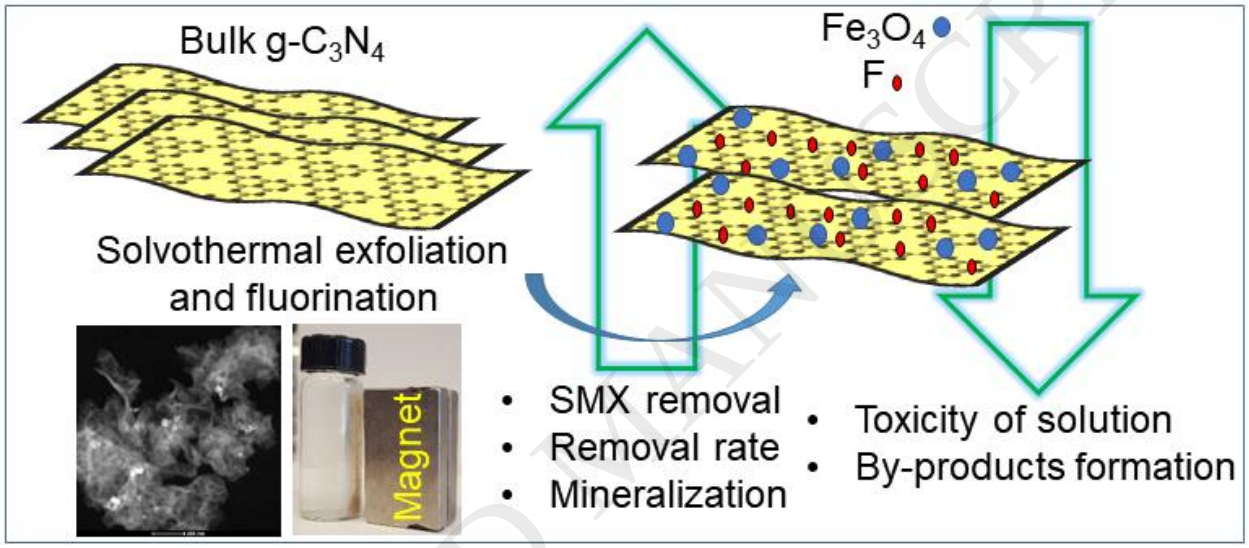
Magnetic fluorinated mesoporous g-C_3N_4 for photocatalytic degradation of amoxicillin: transformation mechanism and toxicity assessment

Amir Mirzaei, Zhi Chen, Fariborz Haghighat, Laleh Yerushalmi

Department of Building, Civil and Environmental Engineering (BCEE), Faculty of Engineering & Computer Sciences, Concordia University, Montreal, Quebec, Canada

Graphical Abstract



Highlights

- Magnetic, porous fluorinated g-C_3N_4 was prepared by a facile hydrothermal method.
- Modified g-C_3N_4 showed photocatalytic activity under both UV and visible light.
- Mineralization, toxicity, by-products formation and kinetics of removal were evaluated.
- 10W UV lamp produced a higher catalytic activity compared to 500W visible lamp.
- Modified g-C_3N_4 photocatalysts exhibited excellent property and reusability.

Abstract

A novel fluorinated graphite carbon nitride photocatalyst with magnetic properties was synthesized by a facile hydrothermal method and used for degradation of amoxicillin (AMX) in water. Compared to the bulk g-C_3N_4, magnetic fluorinated Fe_3O_4/g-C_3N_4 (FeGF) with a high specific surface area (243 $m^2.g^{-1}$) and easy separation from aqueous solution by magnet, led to improved photocatalytic activity in terms of AMX removal and mineralization as well as detoxification of the solution. The results showed that in comparison with a 500 W visible lamp, using a UV lamp