

Fenton-like reaction and photocatalysis using ferrous oxalate and g-C₃N₄ enhancing reactive oxygen species for dye wastewater degradation under visible-light irradiation

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ABSTRACT

In this study, a catalyst material consisting of g-C₃N₄ and ferrous oxalate was synthesized via a simple and environment-friendly method. Then, the catalyst was characterized using various techniques. The photocatalytic performance of the catalysts in the degradation of Rhodamine B was evaluated under visible-light irradiation. Based on the experimental results, the combination of g-C₃N₄ and ferrous oxalate was crucial to enhance the separation of charge carriers and improve the O₂ reduction under visible light. This process also promoted the production of hydroxyl radicals ([•]OH). In the system, oxalate was used to assist the conversion between Fe²⁺ and Fe³⁺, with the chelation of Fe³⁺ to form a complex, to avoid the formation of sludge. Furthermore, without the addition of hydrogen peroxide (H₂O₂), the system had efficient photodegradation with excellent effect. This study provided an innovative idea for the application of ferrous oxalate in photocatalysis and Fenton-like reaction.

Keywords: Ferrous oxalate; g-C₃N₄; Photocatalytic; Rhodamine B; Characterization

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