

Construction of Novel Metal-Free Graphene Oxide/Graphitic Carbon Nitride Nanohybrids: A 2D–2D Amalgamation for the Effective Dedyeing of Waste Water

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Abstract

In this present study, we have reported a novel metal-free graphene oxide/graphitic carbon nitride (GO/g-C₃N₄) 2D/2D hybrid heterojunction for the removal of hazardous organic contaminants in aqueous solution under visible light illumination. The reported photocatalyst was prepared by the combined ultrasonic dispersion method and thoroughly investigated by several spectral and microscopic studies viz FT-IR, p-XRD, SEM with EDX, TEM, XPS Photoluminescence etc. The photocatalytic activity of GO/g-C₃N₄ nanohybrids much outperformed than pristine g-C₃N₄ sample in the photodegradation of Rhodamine B and crystal violet organic pollutants. The enhanced synergistic effect of GO/g-C₃N₄ is mainly due to the proficient separation of photogenerated electron-hole pairs and tuned band gap with unique morphology. The major active species was determined by radical quenching experimental results with employing different scavengers. In this article, designates that the metal-free hybrid heterojunction photocatalyst was a hopeful material in the waste-water control.

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