

Photocatalytic Organic Dye Bleaching using Modified Graphitic Carbon Nitride (g-C₃N₄)

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Removing pollutants from water is important to maintaining clean environment and eco system. Among various technologies, water purification using photocatalyst is easy and simple to handle, and able to use sunlight directly. The most widely used photocatalyst is TiO₂ powder which is cheap, but e⁻h⁺ pairs separation occurred mostly under UV light irradiation which is hard to utilize long wavelength region even sunlight consist with large portion of above wavelength of visible light. To utilize sunlight properly, photocatalyst have to be adsorbed long wavelength light and generate e⁻h⁺ pairs.

Herein, a polymer photocatalyst synthesized from co-polymerization of precursors, g-C₃N₄ were developed to degrade organic dye (RhB). The nanostructured g-C₃N₄ can enhance its photocatalytic activity due to its thin layer which is reduced electron and hole recombination. Moreover C/N ratio regulated g-C₃N₄ can remove organic dye much faster than non-structure, structured g-C₃N₄ and TiO₂ nanoparticle under visible light irradiation (> 420nm). The chemical composition regulation make red shift of energy band of g-C₃N₄. Unlike sulfide and oxynitride semiconductor, g-C₃N₄ is stable under light irradiation. The high stability and moderate band gap imply that g-C₃N₄ has numerous potential application in the photocatalyst field.