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Fabrication of a novel g-C₃N₄/Carbon nanotubes/Ag₃PO₄ Z-Scheme photocatalyst with enhanced photocatalytic performance

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Abstract: A novel g-C₃N₄/Carbon nanotubes/Ag₃PO₄ (g-C₃N₄/CNTs/Ag₃PO₄) Z-Scheme photocatalyst was prepared to investigate the photocatalytic performance. The CNTs uniformly distribute between g-C₃N₄ nanosheets and Ag₃PO₄ nanoparticles and could act as the electron mediator between g-C₃N₄ and Ag₃PO₄ in the Z-Scheme reaction process to significantly improve the photocatalytic performance of nanocomposite g-C₃N₄/CNTs/Ag₃PO₄. Meanwhile, g-C₃N₄/CNTs/Ag₃PO₄ showed a highly photocatalytic stability and a universal activity for photocatalytic degradation of dyes.

Keywords: Composite materials; Semiconductor; Z-Scheme photocatalyst; g-C₃N₄/CNTs/Ag₃PO₄; Photocatalytic degradation

1. Introduction

As a green technology, photocatalysis based on semiconductor addresses current problems related with environment and energy crisis [1-4]. Establishing highly effective photocatalytic and photoelectrochemical reaction system is of great significance to develop photocatalytic technology [5-11]. As an important photocatalytic reaction protocol, the Z-scheme system has attracted extensive attention due to its effective separation of photogenerated carriers and enhanced photocatalytic activity [12-14]. The Z-scheme photocatalysts can form recombination centers relying on the heterojunctions formed by energy bands matching of the semiconductors. The effective separation of

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