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Interface engineered construction of porous g-C₃N₄/TiO₂ heterostructure for enhanced photocatalysis of organic pollutants

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Abstract:

A porous g-C₃N₄/TiO₂ with hierarchical heterostructure has been successfully fabricated through the in situ assembling of small needle-like TiO₂ on the surface of ultrathin g-C₃N₄ sheets. The ultrathin g-C₃N₄ sheets with carbon vacancies and rich hydroxyl groups were found to facilitate the nucleation and in situ growth of TiO₂ and also to modulate the surface chemical activity of the g-C₃N₄/TiO₂ hierarchical heterostructure. The as-designed photocatalytic heterojunction degraded Acid Orange with 82% efficiency after 10 min under simulated solar light, and possessed excellent cycle stability. Relative physical characterizations and photochemical experiments reveal that engineering the interface/surface of g-C₃N₄ plays a vital role in effectively constructing heterostructures of g-C₃N₄/TiO₂, thus realizing efficient photoinduced electron-hole separation during photocatalytic process.

Keywords: hierarchical heterostructure, interface engineering, M-g-C₃N₄/TiO₂, photocatalyst,

1. Introduction

Azo dyes are the most infamous and widespread environmental pollutants, producing waste

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