CNQDs/g-C_3N_4 纳米片复合光催化材料制备及光催化性能研究

摘要：采用气态模板将体相 g-C_3N_4（BC-CN）制备成层状 g-C_3N_4（NL-CN），采用高温分解法制备 g-C_3N_4 量子点（CNQDs），最后利用光沉积将 CNQDs 与 NL-CN 复合，形成 CNQDs/NL 复合光催化剂，提高了其光催化性能。样品的形貌、结构和光谱性质分别通过 XRD、SEM、TEM、UV-VIS 吸收光谱、PL 光谱等进行表征。结果证明，在 NL-CN 中复合 CNQDs，CB 和 VB 电位均下降，带隙变窄，光催化性能有所提升。通过 Rhb 降解曲线、瞬态光响应电流、奎纳斯图谱、Mott-Schottky 表征光催化性能。当 NL 与 CNQDs 的比例为 1:5 时，对 RhB 的降解效果和在 TEOA 中的产氢效率最佳。这表明，NL-CN 与 CNQDs 的复合能有效提高 g-C_3N_4 的光催化性能。

关键词：CNQDs；g-C_3N_4；复合光催化剂；异质结

Preparation and catalytic performance of CNQDs/g-C_3N_4 composite photocatalysts

Abstract： Bulk g-C_3N_4 (BC-CN) was prepared into layered g-C_3N_4 (NL-CN) by gaseous template, and g-C_3N_4 quantum dots (CNQDs) were prepared by pyrolysis method. Finally, photodeposition was used to compound CNQDs with NL-CN to form CNQDs/NL composite photocatalyst, which improved its photocatalytic performance.The morphology, structure and spectral properties of the samples were characterized by XRD, SEM, TEM, uv-vis absorption spectra and PL spectra.The results showed that the potential of CB and VB decreased, the band gap narrowed, and the photocatalytic performance was improved in the compound CNQDs in NL-CN.Photocatalytic performance was characterized by Rhb degradation curve, transient light response current, EIS spectrum and mott-schottky.When the ratio of NL to CNQDs was 1:5, the degradation effect of RhB and the hydrogen production efficiency in TEOA were the best.This shows that the combination of NL-CN and CNQDs can effectively improve the photocatalytic performance of g-c3n4.

Key words: CNQDs；g-C_3N_4；Composite photocatalyst；heterojunction

目 录