

Accepted Manuscript

Title: Construction of novel ternary component photocatalyst $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ coupled with g- C_3N_4 and Ag toward efficient visible light photocatalytic activity for environmental remediation

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PII: S0926-3373(15)30071-0
DOI: <http://dx.doi.org/doi:10.1016/j.apcatb.2015.07.052>
Reference: APCATB 14196

To appear in: *Applied Catalysis B: Environmental*

Received date: 7-5-2015
Revised date: 25-7-2015
Accepted date: 27-7-2015

Please cite this article as: Xin Xin, Junyu Lang, Tingting Wang, Yiguo Su, Yanxia Zhao, Xiaojing Wang, Construction of novel ternary component photocatalyst $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ coupled with g- C_3N_4 and Ag toward efficient visible light photocatalytic activity for environmental remediation, *Applied Catalysis B, Environmental* <http://dx.doi.org/10.1016/j.apcatb.2015.07.052>

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Construction of novel ternary component photocatalyst $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ coupled with g- C_3N_4 and Ag toward efficient visible light photocatalytic activity for environmental remediation

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Graphical abstract A novel ternary component Ag- $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ /g- C_3N_4 photocatalytic system was successfully prepared to show highly enhanced visible light photocatalytic activity toward Cr(VI) photoreduction and methyl orange degradation.

Abstract

This work reports on the fabrication of a novel ternary component Ag- $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ /g- C_3N_4 photocatalytic system with highly enhanced visible light photocatalytic activity toward Cr(VI) photoreduction and methyl orange degradation. The result indicated that $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ nanoparticles were deposited on the surface of g- C_3N_4 with high dispersion and that obtained $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ /g- C_3N_4 heterojunction photocatalyst showed strong absorption in the visible light region. The $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ /50 wt%-g- C_3N_4 composite displayed increased photocatalytic activity for Cr(VI) photoreduction and methyl orange degradation in comparison with the pristine $\text{Sr}_{0.25}\text{H}_{1.5}\text{Ta}_2\text{O}_6 \cdot \text{H}_2\text{O}$ and g- C_3N_4 under visible light irradiation. The matching of the band structure between

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