Title: Construction of novel ternary component photocatalyst $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$ coupled with g-C_3N_4 and Ag toward efficient visible light photocatalytic activity for environmental remediation

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Construction of novel ternary component photocatalyst $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$ coupled with g-C_3N_4 and Ag toward efficient visible light photocatalytic activity for environmental remediation

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Graphical abstractA novel ternary component Ag-$Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$/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-$Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$/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 $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$ nanoparticles were deposited on the surface of g-C_3N_4 with high dispersion and that obtained $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$/g-$C_3N_4$ heterojunction photocatalyst showed strong absorption in the visible light region. The $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$/50 wt%-g-$C_3N_4$ composite displayed increased photocatalytic activity for Cr(VI) photoreduction and methyl orange degradation in comparison with the pristine $Sr_{0.25}H_{1.5}Ta_2O_6 \cdot H_2O$ and g-C_3N_4 under visible light irradiation. The matching of the band structure between