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## Regular Article

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**Room-temperature synthesis of carnation-like ZnO@AgI hierarchical nanostructures assembled by AgI nanoparticles-decorated ZnO nanosheets with enhanced visible light photocatalytic activity**

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**Abstract:**

The preparation of highly efficient visible-light-driven photocatalyst for the photodegradation of organic pollutants has received much attention due to the increasing global energy crises and environmental pollution. In this study, carnation-like ZnO@AgI hierarchical nanostructures assembled by AgI nanoparticles-decorated ZnO nanosheets were successfully prepared via a room-temperature route. The as-prepared ZnO@AgI nanostructures exhibited highly efficient photocatalytic activity under visible light irradiation ( $\lambda > 400$  nm). Under optimized AgI content, the ZnO@AgI-5% sample showed high photocatalytic activity, which was 25.7 and 1.5 times the activity of pure ZnO and pure AgI, respectively. Mechanism studies indicated that superoxide anion radicals ( $\bullet\text{O}_2^-$ ) was the main reactive species in the photocatalytic process. The high photocatalytic activity of the ZnO@AgI nanostructures is attributed to the highly active AgI nanoparticles and the heterojunction between AgI nanoparticles and ZnO nanosheets. The heterojunction

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