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CdS/Graphene Nanocomposite Photocatalysts

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Abstract

Heterogeneous photocatalysis using semiconductors and renewable solar energy has been regarded as one of the most promising processes to alleviate, and even solve, both the world crises of energy supply and environmental pollution. In the past few years, many encouraging achievements have been made in the research area of graphene-based semiconductor photocatalysts. Among them, CdS/graphene nanocomposites have attracted extensive attention as an important kind of photocatalyst in chemical and material science, due to its superior photocatalytic activity and photostability under visible-light irradiation. The aim here is to address the enhancement mechanism of the photocatalytic performance of CdS/graphene composite photocatalysts, and systematically summarize recent progress regarding the design and synthesis of CdS/graphene nanocomposites. These nanocomposites are promising for a great diversity of applications in visible-light photocatalytic fields, including artificial photosynthetic systems (photocatalytic hydrogen production and CO₂ reduction), environmental remediation, and organic photosynthesis. Special attention is given to the photocatalytic hydrogen production and pollutant photodegradation over CdS/graphene nanocomposite photocatalysts. Furthermore, perspectives on CdS/graphene-based materials are discussed, including the various remaining challenges for large-scale applications, identifying prospective areas for related research in this field.

Keywords

Author Keywords: cadmium sulfide; graphene; nanocomposites; photocatalysts; visible light

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