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**Building a direct Z-scheme heterojunction photocatalyst by
ZnIn₂S₄ nanosheets and TiO₂ hollowspheres for
highly-efficient artificial photosynthesis**

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Abstract

Facing the requirement of modern industrial development, selective reduction of 4-nitroaniline (4-NA) into p-phenylenediamine (PPD) via a facile, economic and eco-friendly photocatalysis technique has attracted more and more attention in recent years. In this study, ZnIn₂S₄ (ZIS) nanosheets grew in-situ on the surface of TiO₂ hollowspheres through a hydrothermal method and formed a direct Z-scheme heterojunction composite, which exhibited exceedingly better photocatalytic 4-NA reduction performance than bare ZIS and TiO₂. Such enhancement was mainly attributed to the dissimilar dimensionalities, intimate contact, and matchable band edge positions between ZIS and TiO₂ semiconductors. Moreover, the substantial mechanism for the photocatalytic reaction in the ZIS/TiO₂ system was reasonably

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