

# Enhancement in water reduction activity of SrTiO<sub>3</sub> and CdS by fabricating hollow nanocarbon spheres and constructing heterojunction under sunlight illumination

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## Abstract

Nowadays, hollow nanocarbon spheres were used as new carbon materials in the field of photocatalysis due to their extraordinary electron transfer and high visible-light harvesting potentials.[1] In present work, smart architecture of novel ternary hollow nanocarbon mediated Z-scheme SrTiO<sub>3</sub>-CdS nanojunction was synthesized via insitu-hydrothermal method and applied towards photocatalytic H<sub>2</sub> production under sun light illumination. Here, SrTiO<sub>3</sub> and CdS were selected as two semiconductor photocatalysts and hollow nanocarbon spheres were served as the solid electron mediator to fabricate ternary Z-scheme photocatalytic system. The formation of nanojunction was explained PXRD, TEM, and XPS. Compared to single component photocatalysts, the composite photocatalysts were exhibited excellent H<sub>2</sub> production rates (HPR), especially exhibited high HPR. Hollow nanocarbon spheres play a major role as an electron collector and transporter to improve the charge transfer at the interface of SrTiO<sub>3</sub>-CdS photocatalytic system. The high HPR of the hollow nanocarbon mediated Z-scheme SrTiO<sub>3</sub>-CdS nanojunction was demonstrated by photocurrent studies. A suitable mechanism was also proposed for efficient charge transfer in ternary hollow nanocarbon mediated Z-scheme SrTiO<sub>3</sub>-CdS nanojunction.

## References

1. S. Li, A. Pasc, V. Fierro and A. Celzard, *J. Mater. Chem. A*, 2016, **4**, 12686–12713.