

Web of Science

[Full Text from Publisher](#) |
 [Look Up Full Text](#) |
 |
 Save to EndNote online |
 [Add to Marked List](#)

264 of 491

Efficient Self-Assembly Synthesis of Uniform CdS Spherical Nanoparticles-Au Nanoparticles Hybrids with Enhanced Photoactivity

By: Han, SC (Han, Sancan)^[1]; Hu, LF (Hu, Linfeng)^[1]; Gao, N (Gao, Nan)^[1]; Al-Ghamdi, AA (Al-Ghamdi, Ahmed A.)^[2]; Fang, XS (Fang, Xiaosheng)^[1]

[View ResearcherID and ORCID](#)

ADVANCED FUNCTIONAL MATERIALS

Volume: 24 Issue: 24 Pages: 3725-3733

DOI: 10.1002/adfm.201400012

Published: JUN 2014

[View Journal Impact](#)

Abstract

The treatment of environmental pollution has become one of the most critical issues in the world. Despite the progress made in the study of semiconductor photocatalysis, it is still a challenge to obtain photocatalysts with high activity through relatively simple fabrication processes. In this work, monodisperse CdS spherical nanoparticles (SNPs) of various sizes and good crystallinity are obtained by only adjusting the starting ratio of reactants and the reaction temperature, exhibiting high photocatalytic performances. The photocatalytic rate constant of the approximate to 100 nm CdS SNPs, especially, is more than double that of P25. Furthermore, 3-mercaptopropyltrimethoxysilane is used to assist the interaction between approximate to 200 nm CdS SNPs and citrate-stabilized Au nanoparticles (NPs). The significant increase of photocatalytic activity is confirmed by the degradation of Rhodamine B (RhB) under Xe light irradiation. At the optimal Au concentration (0.5 wt%), the prepared nanohybrids show the highest photocatalytic activity, exceeding that of pure CdS two times. The superior photocatalytic performances of the CdS SNPs-Au nanohybrids can be attributed to the intimate interfacial contact between CdS SNPs and Au NPs, which is a contributing factor to the improvement of transfer and the fate of photogenerated charge carriers from CdS SNPs to Au NPs.

Keywords

Author Keywords: CdS SNPs; Au NPs; photocatalytic performance; photoluminescence

KeyWords Plus: HIGH PHOTOCATALYTIC ACTIVITY; TEMPLATE-FREE SYNTHESIS; VISIBLE-LIGHT; HYDROGEN-PRODUCTION; QUANTUM DOTS; PLASMON RESONANCE; METAL NANOPARTICLES; CHARGE SEPARATION; TITANIUM-DIOXIDE; FACILE SYNTHESIS

Author Information

Reprint Address: Han, SC (reprint author)

+ Fudan Univ, Dept Mat Sci, Shanghai 200433, Peoples R China.

Addresses:

+ [1] Fudan Univ, Dept Mat Sci, Shanghai 200433, Peoples R China

+ [2] King Abdulaziz Univ, Fac Sci, Dept Phys, Jeddah, Saudi Arabia

E-mail Addresses: xshfang@fudan.edu.cn

Funding

Funding Agency	Grant Number
National Natural Science Foundation of China	91123006 51372040
Shanghai Shu Guang Project	12SG01

Citation Network

109 Times Cited

84 Cited References

[View Related Records](#)

[Create Citation Alert](#)

(data from Web of Science Core Collection)

All Times Cited Counts

111 in All Databases

109 in Web of Science Core Collection

4 in BIOSIS Citation Index

12 in Chinese Science Citation Database

0 in Data Citation Index

0 in Russian Science Citation Index

0 in SciELO Citation Index

Usage Count

Last 180 Days: 26

Since 2013: 256

[Learn more](#)

Most Recent Citation

Cheng, Yi-Feng. Efficient photodegradation of dye pollutants using a novel plasmonic AgCl microrods array and photo-optimized surface-enhanced Raman scattering . APPLIED CATALYSIS B- ENVIRONMENTAL, NOV 15 2017.

[View All](#)

This record is from:

Web of Science Core Collection
- Science Citation Index Expanded

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

Shanghai Pujiang Program	12PJ1400300
Innovation Program of Shanghai Municipal Education Commission	14ZZ003
Science and Technology Commission of Shanghai Municipality	13NM1400300 11520706200
Program for Professor of Special Appointment (Eastern Scholar) at Shanghai Institutions of Higher Learning	
Program for New Century Excellent Talents in University	NCET-11-0102
National Basic Research Program of China	2012CB932303

[View funding text](#)

Publisher

WILEY-VCH VERLAG GMBH, BOSCHSTRASSE 12, D-69469 WEINHEIM, GERMANY

Categories / Classification

Research Areas: Chemistry; Science & Technology - Other Topics; Materials Science; Physics

Web of Science Categories: Chemistry, Multidisciplinary; Chemistry, Physical; Nanoscience & Nanotechnology; Materials Science, Multidisciplinary; Physics, Applied; Physics, Condensed Matter

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000337953200011

ISSN: 1616-301X

eISSN: 1616-3028

Journal Information

Table of Contents: [Current Contents Connect](#)

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: AJ8KR

Cited References in Web of Science Core Collection: **84**

Times Cited in Web of Science Core Collection: **109**