

## Web of Science

Search

Search Results

My Tools

Search History

Marked List

Full Text from Publisher

Look Up Full Text



Save to EndNote online

Add to Marked List

129 of 491

## One-Step Hydrothermal Synthesis of 2D Hexagonal Nanoplates of alpha-Fe<sub>2</sub>O<sub>3</sub>/Graphene Composites with Enhanced Photocatalytic Activity

By: Han, SC (Han, Sancan)<sup>[1]</sup>; Hu, LF (Hu, Linfeng)<sup>[1]</sup>; Liang, ZQ (Liang, Ziqi)<sup>[1]</sup>; Wageh, S (Wageh, Swelm)<sup>[2]</sup>; Al-Ghamdi, AA (Al-Ghamdi, Ahmed A.)<sup>[2]</sup>; Chen, YS (Chen, Yongsheng)<sup>[3,4]</sup>; Fang, XS (Fang, Xiaosheng)<sup>[1]</sup>

[View ResearcherID and ORCID](#)

### ADVANCED FUNCTIONAL MATERIALS

Volume: 24 Issue: 36 Pages: 5719-5727

DOI: 10.1002/adfm.201401279

Published: SEP 24 2014

[View Journal Impact](#)

### Abstract

There has been significant progress in the field of semiconductor photocatalysis, but it is still a challenge to fabricate low-cost and high-activity photocatalysts because of safety issues and non-secondary pollution to the environment. Here, 2D hexagonal nanoplates of -Fe<sub>2</sub>O<sub>3</sub>/graphene composites with relatively good distribution are synthesized for the first time using a simple, one-step, template-free, hydrothermal method that achieves the effective reduction of the graphene oxide (GO) to graphene and intimate and large contact interfaces of the -Fe<sub>2</sub>O<sub>3</sub> nanoplates with graphene. The -Fe<sub>2</sub>O<sub>3</sub>/graphene composites showed significantly enhancement in the photocatalytic activity compared with the pure -Fe<sub>2</sub>O<sub>3</sub> nanoplates. At an optimal ratio of 5 wt% graphene, 98% of Rhodamine (RhB) is decomposed with 20 min of irradiation, and the rate constant of the composites is almost four times higher than that of pure -Fe<sub>2</sub>O<sub>3</sub> nanoplates. The decisive factors in improving the photocatalytic performance are the intimate and large contact interfaces between 2D hexagonal -Fe<sub>2</sub>O<sub>3</sub> nanoplates and graphene, in addition to the high electron withdrawing/storing ability and the high conductivity of reduced graphene oxide (RGO) formed during the hydrothermal reaction. The effective charge transfer from -Fe<sub>2</sub>O<sub>3</sub> nanoplates to graphene sheets is demonstrated by the significant weakening of photoluminescence in -Fe<sub>2</sub>O<sub>3</sub>/graphene composites.

### Keywords

**Author Keywords:** nanoplates; graphene; photocatalytic performance; photoluminescence; composite materials

**KeyWords Plus:** VISIBLE-LIGHT; ENVIRONMENTAL APPLICATIONS; STORAGE PROPERTIES; GRAPHITE OXIDE; GRAPHENE; NANOCOMPOSITES; NANOPARTICLES; DEGRADATION; PERFORMANCE; TIO<sub>2</sub>

### 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, Dept Phys, Fac Sci, Jeddah 21589, Saudi Arabia

+ [3] Nankai Univ, Inst Polymer Chem, Coll Chem, Key Lab Funct Polymer Mat, Tianjin 300071, Peoples R China

+ [4] Nankai Univ, Inst Polymer Chem, Coll Chem, Ctr Nanoscale Sci & Technol, Tianjin 300071, Peoples R China

**E-mail Addresses:** [linfenghu@fudan.edu.cn](mailto:linfenghu@fudan.edu.cn); [xshfang@fudan.edu.cn](mailto:xshfang@fudan.edu.cn)

### Citation Network

93 Times Cited

53 Cited References

[View Related Records](#)

[Create Citation Alert](#)

*(data from Web of Science Core Collection)*

### All Times Cited Counts

96 in All Databases

93 in Web of Science Core Collection

4 in BIOSIS Citation Index

11 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: 38

Since 2013: 349

[Learn more](#)

### Most Recent Citation

Rameshbabu, R. [Visible light responsive Cu<sub>2</sub>MoS<sub>4</sub> nanosheets incorporated reduced graphene oxide for efficient degradation of organic pollutant](#). APPLIED SURFACE SCIENCE, OCT 1 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](#).

**Funding**

Funding Agency	Grant Number
Science and Technology Commission of Shanghai Municipality	13NM1400300
Shanghai Shu Guang Project	12SG01
National Natural Science Foundation of China	91123006 51372040
Shanghai Pujiang Program	12PJ1400300
Innovation Program of Shanghai Municipal Education Commission	14ZZ003
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

[View funding text](#)

**Publisher**

WILEY-V C H 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:000342621900010

**ISSN:** 1616-301X

**eISSN:** 1616-3028

**Journal Information**

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

**Impact Factor:** [Journal Citation Reports](#)

**Other Information**

**IDS Number:** AQ2MX

**Cited References in Web of Science Core Collection:** **53**

**Times Cited in Web of Science Core Collection:** **93**