

Accepted Manuscript

Novel Magnetically Separable $\text{Ag}_3\text{PO}_4@\text{CuFe}_2\text{O}_4$ Micro-nanocomposite with Highly Enhanced Visible-light-driven Photocatalytic Activity

Tianhong Zhou, Guozhen Zhang, Pengjun Ma, Xiaoli Qiu, Hongwei Zhang, Hao Yang, Gang Liu

PII: S0167-577X(17)31379-4
DOI: <http://dx.doi.org/10.1016/j.matlet.2017.09.044>
Reference: MLBLUE 23158

To appear in: *Materials Letters*

Received Date: 1 June 2017
Revised Date: 10 September 2017
Accepted Date: 12 September 2017

Please cite this article as: T. Zhou, G. Zhang, P. Ma, X. Qiu, H. Zhang, H. Yang, G. Liu, Novel Magnetically Separable $\text{Ag}_3\text{PO}_4@\text{CuFe}_2\text{O}_4$ Micro-nanocomposite with Highly Enhanced Visible-light-driven Photocatalytic Activity, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.09.044>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Novel Magnetically Separable $\text{Ag}_3\text{PO}_4@\text{CuFe}_2\text{O}_4$ Micro-nanocomposite with Highly Enhanced Visible-light-driven Photocatalytic Activity

Tianhong Zhou ^{a,b}, Guozhen Zhang ^{a*}, Pengjun Ma ^b, Xiaoli Qiu ^b,

Hongwei Zhang ^a, Hao Yang ^a, Gang Liu ^b

^a School of environmental and municipal engineering, Lanzhou Jiaotong University,

Lanzhou 730070, PR China

^b Research & Development Center for Eco-material and Eco-chemistry, Lanzhou Institute of Chemical
Physics, Chinese Academy of Sciences, Lanzhou 730000, PR China

Abstract: An effective visible-light-driven $\text{Ag}_3\text{PO}_4@\text{CuFe}_2\text{O}_4$ Z-scheme magnetic micro-nanocomposite was successfully fabricated by a simple ion-exchange deposition method. The $\text{Ag}_3\text{PO}_4@\text{CuFe}_2\text{O}_4$ photocatalyst exhibited remarkably enhanced photocatalytic activity (degradation efficiency was ~99% within 30 min and kinetic constant reached 0.1423 min^{-1}) as compared to Ag_3PO_4 and CuFe_2O_4 for the degradation of Rhodamine B (RhB). Comparing the activity results dependence with the characterization results, it was indicated that the dependence of the photocatalytic activity on the efficient separation of photogenerated $\text{h}^+ \cdot \text{e}^-$ pairs. This study might provide a promising visible light responsive photocatalyst for the photocatalytic degradation of organic dyes in waste water.

Keywords: Composite materials, Magnetic materials, Z-scheme, Visible photocatalytic, highly effective

1. Introduction

In recent decades, environmental pollution due to the rapid industrial expansion and human population growth is one of the most important challenges facing all leaving beings worldwide[1]. Hence, developing effective, environmental-friendly, and low-cost technology for water treatment is one of the key issues[2]. Among various strategies, photocatalytic degradation has attracted much attention as a

* Corresponding author: Tel.: +869314957166; Fax: +869314957166; E-mail: zhangguozhen@mail.lzjtu.cn

Download English Version:

<https://daneshyari.com/en/article/5462648>

Download Persian Version:

<https://daneshyari.com/article/5462648>

[Daneshyari.com](https://daneshyari.com)