Accepted Manuscript

Title: Co-porphyrin/Carbon nitride hybrids for improved photocatalytic CO_2 reduction under visible light

Author: Guixia Zhao Hong Pang Guigao Liu Peng Li Huimin Liu Huabin Zhang Li Shi Jinhua Ye

PII: S0926-3373(16)30532-X
DOI: http://dx.doi.org/doi:10.1016/j.apcatb.2016.06.074
Reference: APCATB 14898

To appear in: *Applied Catalysis B: Environmental*

Received date: 27-5-2016
Revised date: 24-6-2016
Accepted date: 29-6-2016

Please cite this article as: Guixia Zhao, Hong Pang, Guigao Liu, Peng Li, Huimin Liu, Huabin Zhang, Li Shi, Jinhua Ye, Co-porphyrin/Carbon nitride hybrids for improved photocatalytic CO2 reduction under visible light, Applied Catalysis B, Environmental http://dx.doi.org/10.1016/j.apcatb.2016.06.074

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.

ACCEPTED MANUSCRIPT

<AT>Co-porphyrin/Carbon nitride hybrids for improved photocatalytic CO_2 reduction under visible light

<AU>Guixia Zhao[a], Hong Pang[a,b], Guigao Liu[a,b], Peng Li[a], Huimin Liu[a], Huabin Zhang[a], Li Shi[a,b], Jinhua Ye[a,b,c,d*] ##Email##Jinhua.YE@nims.go.jp##/Email##
<AU>
<AFF>[a]International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan
<AFF>[b]Graduate School of Chemical Science and Engineering, Hokkaido University, Sapporo 060-0814, Japan
<AFF>[c]TU-NIMS Joint Research Center, School of Materials Science and Engineering, Tianjin University, Tianjin 300072, PR China
<AFF>[d]Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin 300072, PR China
<PA>* Corresponding author.

<ABS-Head><ABS-HEAD>Graphical abstract
<ABS-P>
<ABS-P><xps:span class="xps_Image">fx1</xps:span>

<ABS-HEAD>Highlights► A covalently linked Co-porphyrin/low-molecular-weight carbon nitride hybrids was prepared for the first time. ► The hybrids possessed improved photocatalytic activity compared with bulk carbon nitride and Co-porphyrin loaded C_3N_4 heterojunction system. ► The efficient electron transfer and trapping by the Co active sites as well as the affinity of Co-porphyrin for CO_2 are considered to account for the enhanced activity. ► Our findings may open a promising route to immobilize the active site into the light-harvest antenna for improved photocatalytic performance.

<ABS-HEAD>Abstract

<ABS-P>A covalently linked reaction center/antenna hybrid composed of Co-porphyrin and low-molecular-weight carbon nitride was developed for the reduction of CO_2 into CO under visible light for the first time. The hybrids possessed thirteen-fold higher photocatalytic activity (17 umol/g/h) compared with bulk carbon nitride, and it is more than twice what it was in the Co-porphyrin loaded C_3N_4 heterojunction system. The efficient electron transfer and trapping by the Co active sites as well as the affinity of Co-porphyrin for CO_2 are considered to account for the enhanced activity. Our findings may open a promising route to modify carbon nitride and

Download English Version:

https://daneshyari.com/en/article/6498884

Download Persian Version:

https://daneshyari.com/article/6498884

Daneshyari.com