

## Accepted Manuscript

Carbonized Metal–Organic Frameworks nanorods as recyclable photocatalyst for visible light-induced water oxidation

Min Zhang, Jianmin Luo, Xiaoyu Liang, Baolin Yan, M.I. Baikenov, Xintai Su, Le Chi, Chao Yang

PII: S0167-577X(17)31326-5  
DOI: <http://dx.doi.org/10.1016/j.matlet.2017.08.119>  
Reference: MLBLUE 23096

To appear in: *Materials Letters*

Received Date: 20 June 2017  
Revised Date: 6 August 2017  
Accepted Date: 29 August 2017

Please cite this article as: M. Zhang, J. Luo, X. Liang, B. Yan, M.I. Baikenov, X. Su, L. Chi, C. Yang, Carbonized Metal–Organic Frameworks nanorods as recyclable photocatalyst for visible light-induced water oxidation, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.08.119>

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.



**Carbonized Metal–Organic Frameworks nanorods as recyclable photocatalyst  
for visible light-induced water oxidation**

Min Zhang<sup>a</sup>, Jianmin Luo<sup>a</sup>, Xiaoyu Liang<sup>a</sup>, Baolin Yan<sup>a</sup>, M.I.Baikenov<sup>b</sup>, Xintai Su<sup>a\*</sup>, Le Chi<sup>a</sup>, and Chao Yang<sup>a\*</sup>

<sup>a</sup>Ministry Key Laboratory of Oil and Gas Fine Chemicals, College of Chemistry and Chemical Engineering, Xinjiang University, Urumqi 830046, China

<sup>b</sup>Ye. A. Buketov Karaganda State University, Karaganda 470061, Kazakhstan

\*Corresponding author:

E-mail: suxintai827@163.com; jerryyang1924@163.com

**Abstract**

Magnetic Fe<sub>2</sub>C nanorods were successfully synthesized by the carbonization of iron-based metal-organic framework (MOF) template and examined as photocatalyst for water oxidation reaction. An apparent turnover frequency (TOF) of  $2.73 \times 10^3 \text{ s}^{-1}$  and oxygen yield of 20.64% were obtained with Fe<sub>2</sub>C in an alkalescent aqueous solution. The rod-like Fe<sub>2</sub>C materials is convenient to recovery and recycling of the catalyst for water oxidation. The surface conditions of the Fe<sub>2</sub>C also remain unchanged after the photocatalytic reaction, as confirmed by X-ray photoelectron spectroscopy (XPS). Our work demonstrates that Fe<sub>2</sub>C as efficient WOCs is a promising candidate for water oxidation.

**Keywords:** Fe<sub>2</sub>C nanorods; carbonization; MOF template; water oxidation; recovery

**Introduction**

Solar-driven water-splitting has been considered as one of the major strategies for solving the global energy problem [1], which contains two process of the hydrogen evolution reaction (HER) and the oxygen evolution reaction (OER) [2]. Of these,

Download English Version:

<https://daneshyari.com/en/article/5462599>

Download Persian Version:

<https://daneshyari.com/article/5462599>

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