

## Accepted Manuscript

Phosphorus-doped cobalt-iron oxyhydroxide with ultrafine nanosheet structure enable efficient oxygen evolution electrocatalysis

Hui Xu, Jingjing Wei, Chaofan Liu, Yangping Zhang, Lin Tian, Caiqin Wang, Yukou Du

PII: S0021-9797(18)30721-5  
DOI: <https://doi.org/10.1016/j.jcis.2018.06.073>  
Reference: YJCIS 23764

To appear in: *Journal of Colloid and Interface Science*

Received Date: 25 April 2018  
Revised Date: 24 June 2018  
Accepted Date: 25 June 2018

Please cite this article as: H. Xu, J. Wei, C. Liu, Y. Zhang, L. Tian, C. Wang, Y. Du, Phosphorus-doped cobalt-iron oxyhydroxide with ultrafine nanosheet structure enable efficient oxygen evolution electrocatalysis, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.06.073>

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.



**Phosphorus-doped cobalt-iron oxyhydroxide with untrafine  
nanosheet structure enable efficient oxygen evolution electrocatalysis**

Hui Xu,<sup>a1</sup> Jingjing Wei,<sup>a1</sup> Chaofan Liu,<sup>a</sup> Yangping Zhang,<sup>a</sup> Lin Tian,<sup>b\*</sup> Caiqin Wang,<sup>c\*</sup>  
and Yukou Du<sup>a\*</sup>

<sup>a</sup> *College of Chemistry, Chemical Engineering and Materials Science, Soochow  
University, Suzhou 215123, PR China*

<sup>b</sup> *College of Chemistry and Chemical Engineering, Xuzhou University of Technology,  
Xuzhou 221111, PR China*

<sup>c</sup> *Chemistry department, University of Toronto, Toronto M5S3H4, RP Canada.*

*\* Corresponding author: Tel: 86-512-65880089, Fax: 86-512-65880089;*

*E-mail: duyk@suda.edu.cn (Y. Du).*

*Hui Xu and Jingjing Wei contributed equally to this work.*

**Abstract**

Although explosive progresses have been achieved in the field of water splitting, the design and development of stable and inexpensive electrocatalysts for oxygen evolution remain a formidable challenge. Herein, the cost-efficient two dimensional (2D) phosphorus-doped oxyhydroxide CoFe nanosheets (denoted as CoFeP NSs) are successfully engineered and showing exceptional oxygen evolution reaction (OER) activity and chemical stability in 1 M KOH solution. This unique 2D nanosheet structure facilitates the mass transfer and electron transport, resulting in the remarkable OER activity that delivers a current density of 10 mA cm<sup>-2</sup> at a low overpotential of 305 mV with an ultra-small Tafel slope 49.6 mV/dec. More significantly, the doped P also plays a vital role in modulating the surface active sites, leading to the substantial enhancement of electrocatalytic performances. Our study provides a facile one-pot method for the successful fabrication of 2D P-doped CoFe NSs which display superior electrocatalytic performance, shedding great promise for environment and energy-related fields.

**Keywords:** CoFeP oxyhydroxides; Two dimensional nanosheets; Oxygen evolution reaction; Phosphorus dopant

Download English Version:

<https://daneshyari.com/en/article/6989664>

Download Persian Version:

<https://daneshyari.com/article/6989664>

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