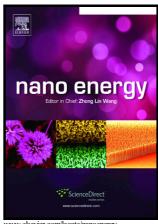
Author's Accepted Manuscript

Surface Reconstruction Engineering of Cobalt Phosphides by Ru Inducement to form Hollow Ru-RuP_x-Co_xP Pre-electrocatalysts with Accelerated Oxygen Evolution Reaction

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ACCEPTED MANUSCRIPT

Surface Reconstruction Engineering of Cobalt Phosphides by Ru Inducement

to form Hollow Ru-RuPx-CoxP Pre-electrocatalysts with Accelerated Oxygen

Evolution Reaction

Lei Wang, †a,1 Quan Zhou, †a,1 Zonghua Pu, b Qi Zhang, a Xueqin Mu, a Haiyan Jing, a Suli Liu, *a

Changyun Chen,*a and Shichun Mu*b

^aDepartment of Chemistry, Nanjing Xiaozhuang University, Nanjing, Jiangsu 211171, P. R. China.

^bState Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of

Technology, Wuhan, Hubei 430056, P. R. China.

E-mail: msc@whut.edu.cn; niuniu_410@126.com; yhjiangccy@126.com.

ABSTRACT: Heteroatom inducement is a possible way to tune the catalytic capability of

electrocatalysts in oxygen evolution reaction (OER). In this work, we adopt a facile solid-liquid-

phase chemical method to yield hollow Ru-RuPx-CoxP polyhedra. Herein, the in-situ introduced

Ru can induce the surface reconstruction of Co₂P into Ru-RuP_x-Co_xP polyhedra due to unstable

surface terminations proved by X-ray diffraction (XRD), X-ray photoelectron spectroscopy

(XPS) and Line-scan electron energy loss spectroscopy (EELS) analyses. As expected, Ru-RuP_x-

Co_xP with large specific surface area and abundant active sites shows remarkable high OER

catalytic activity ($\eta_{10} = 291 \text{ mV}$) and stability (at least 10000 cycles). DFT calculations further

demonstrate that the presence of Ru metal promotes the electrocatalytic reaction kinetics through

increasing the density of states at the Fermi level with reduced intermediate adsorption energy

and improving electron transfer.

Graphical abstract:

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