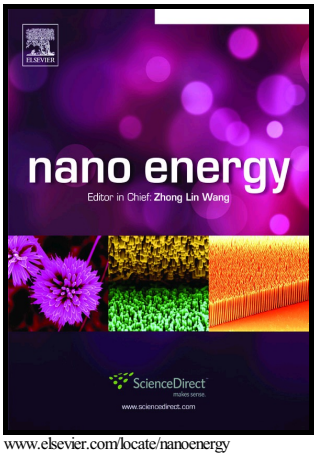

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ABSTRACT: Heteroatom inducement is a possible way to tune the catalytic capability of electrocatalysts in oxygen evolution reaction (OER). In this work, we adopt a facile solid-liquid-phase chemical method to yield hollow Ru-RuP_x-Co_xP polyhedra. Herein, the in-situ introduced Ru can induce the surface reconstruction of Co_2P 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 (η_{10} = 291 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: