

Supporting Information for

**Enhancing the water splitting performance via decorating Co_3O_4
nanoarrays with ruthenium doping and phosphorization**

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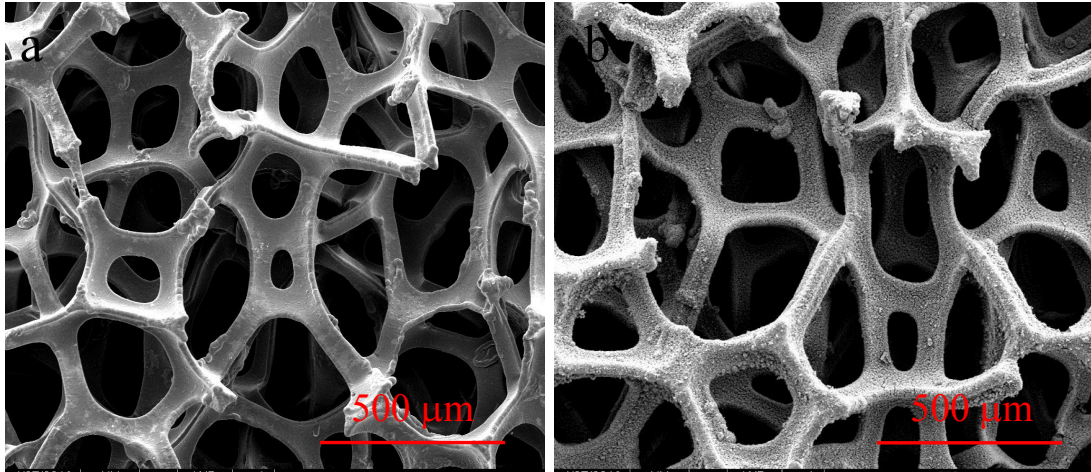


Fig. S1. SEM images of (a) pristine NF and (b) $\text{Co}_3\text{O}_4/\text{NF}$.

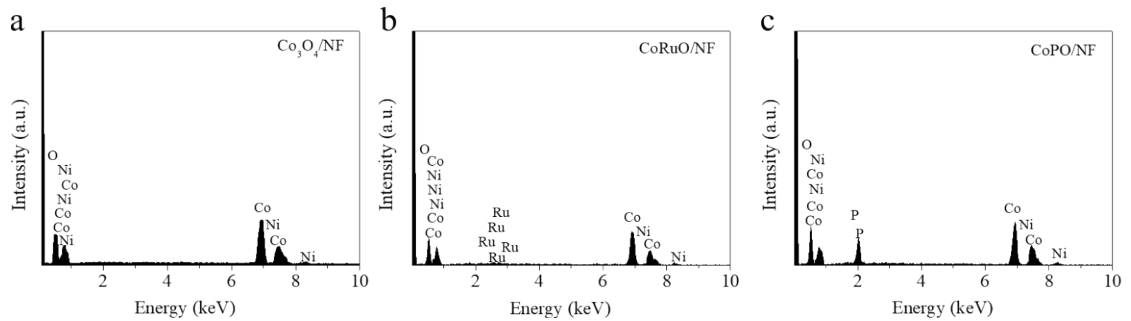


Fig. S2. EDS pattern of (a) $\text{Co}_3\text{O}_4/\text{NF}$ catalyst, (b) CoRuO/NF , and (c) CoPO/NF

Table S1. The weight percentage (wt%) of the main elements for samples.

Samples	Co	Ru	P
CoRuO/NF	47.14wt%	5.84wt%	0
CoPO/NF	45.82wt%	0	7.94wt%
CoRuPO/NF	44.91wt%	4.13wt%	1.36wt%

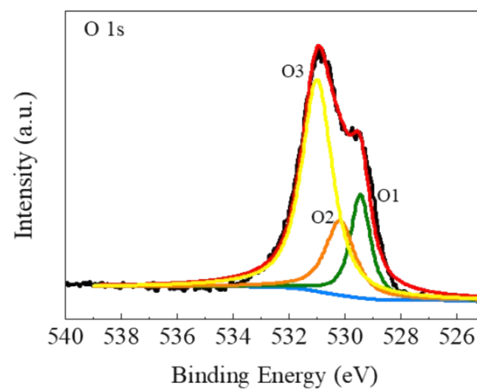


Fig. S3. High resolution of O 1s XPS peak for CoRuPO/NF .

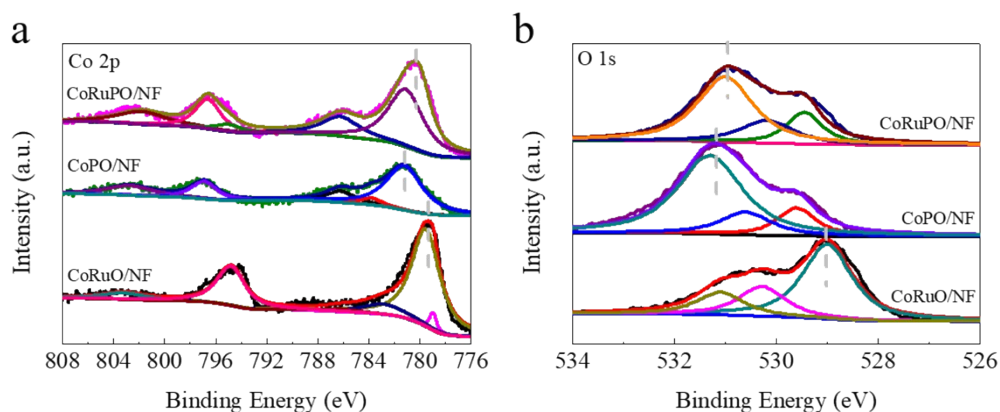


Fig. S4. XPS spectra of (a) CoRuPO/NF, CoPO/NF, and CoRuO/NF in the Co 2p regions, (b) CoRuPO/NF, CoPO/NF and CoRuO/NF in the O 1s regions.

Table S2. Comparisons of the mass activity (MA) for HER.

Samples	MA at 20 mV vs. RHE	Ref
CoRuPO/NF	656 mA mg ⁻¹ _{Ru}	This work
Pt/C/NF	56 mA mg ⁻¹ _{Pt}	This work
Ru@MWCNT	186 mA mg ⁻¹ _{Ru}	1
Pt/C	52 mA mg ⁻¹ _{Pt}	1

Table S3. Comparisons of the mass activity (MA) for OER.

Samples	MA at 250 mV vs. RHE	Ref
CoRuPO/NF	1192 mA mg ⁻¹ _{Ru}	This work
RuO ₂ /NF	297 mA mg ⁻¹ _{Ru}	This work
Ru ₁ -Pt ₃ Cu	779 mA mg ⁻¹ _{Ru}	2
r-RuO ₂ Nps	11 mA mg ⁻¹ _{Ru}	3
r-IrO ₂ Nps	3.5 mA mg ⁻¹ _{Ir}	3

Supplementary References

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