Supporting Information for

Engineering a Nanotubular Mesoporous Cobalt Phosphide Electrocatalyst by Kirkendall Effect towards Highly Efficient Hydrogen Evolution Reaction

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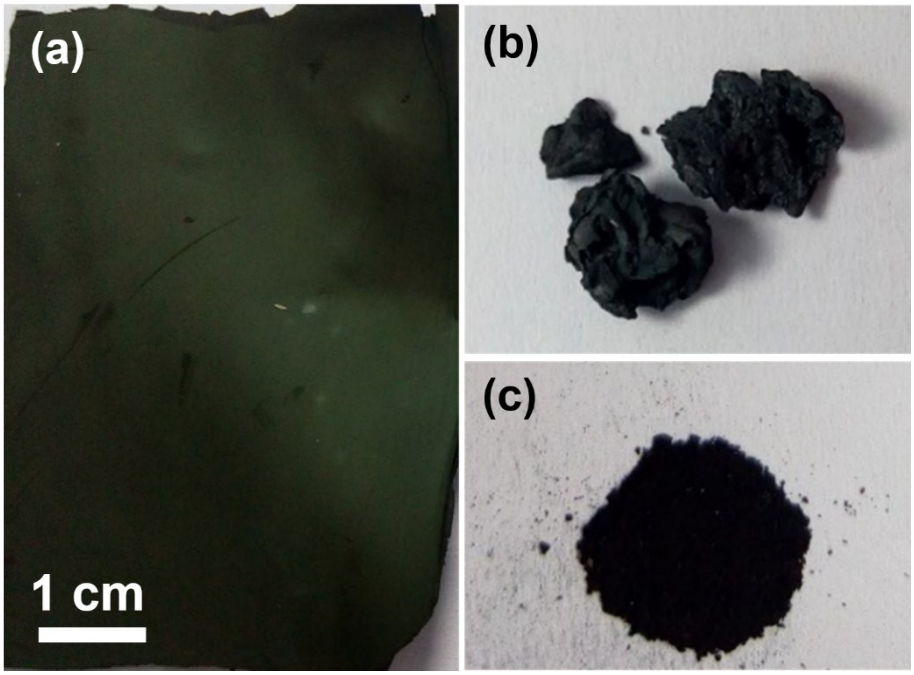

Fig. S1 Photographs of Co_3O_4-NTs (a), W-Co_3O_4-NTs (b) and Co_3O_4-NPs (c).

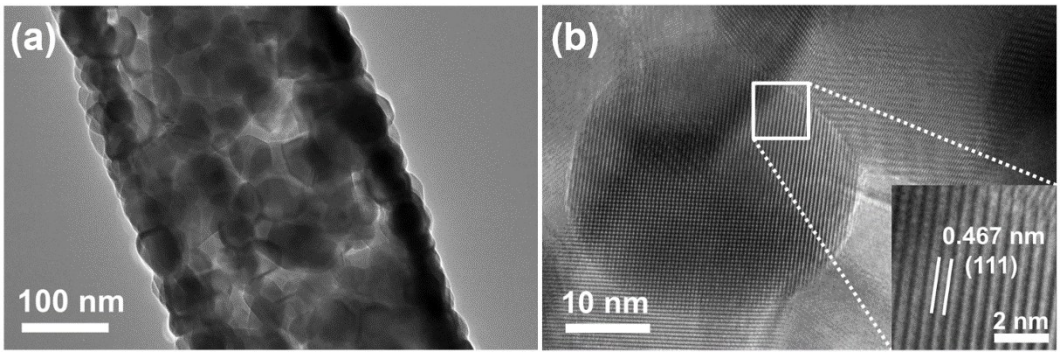

Fig. S2 (a) Transmission electron microscopy (TEM) and (b) high-resolution TEM images of Co_3O_4-NTs.

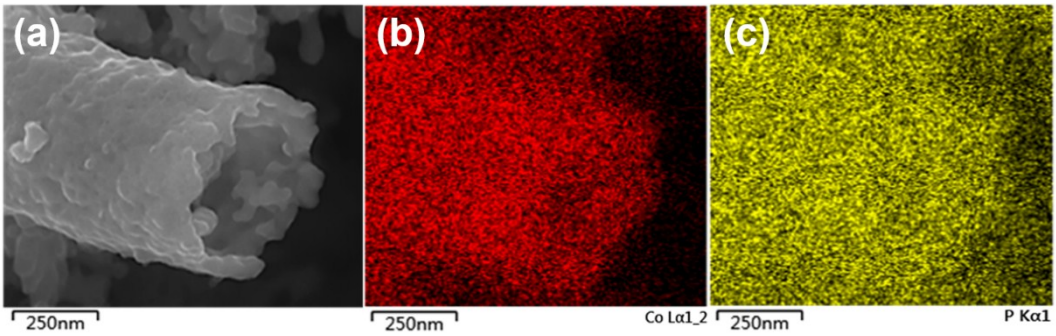

Fig. S3 (a) The field emission scanning electron microscopy image and the corresponding energy dispersive X-ray spectroscopy elemental mappings of CoP-NTs: (b) Co, (c) P.

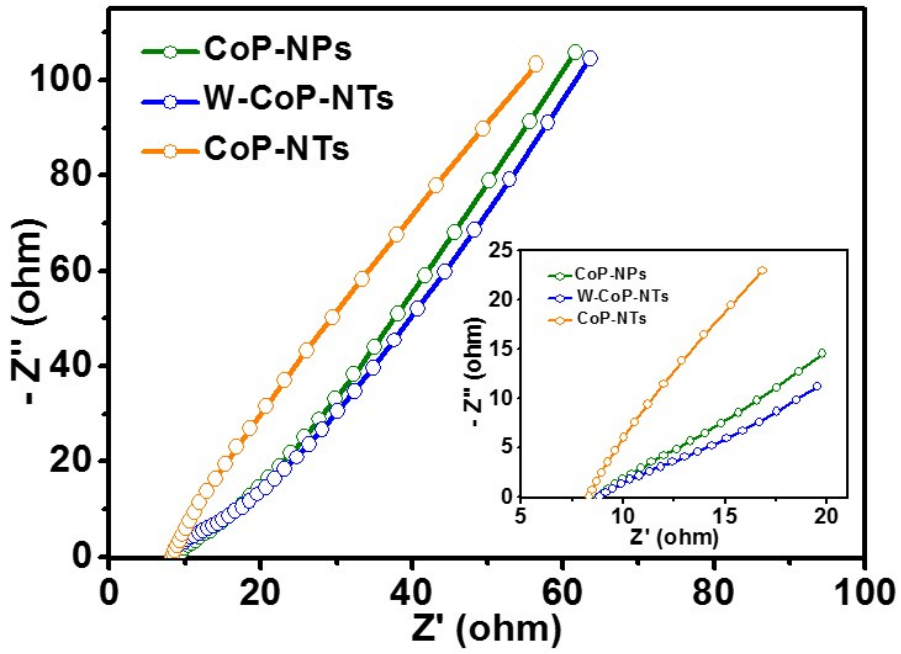

Fig. S4 Nyquist plots of CoP-NPs, W-CoP-NTs and CoP-NTs. Inset: the magnified high-frequency region of the corresponding plots.

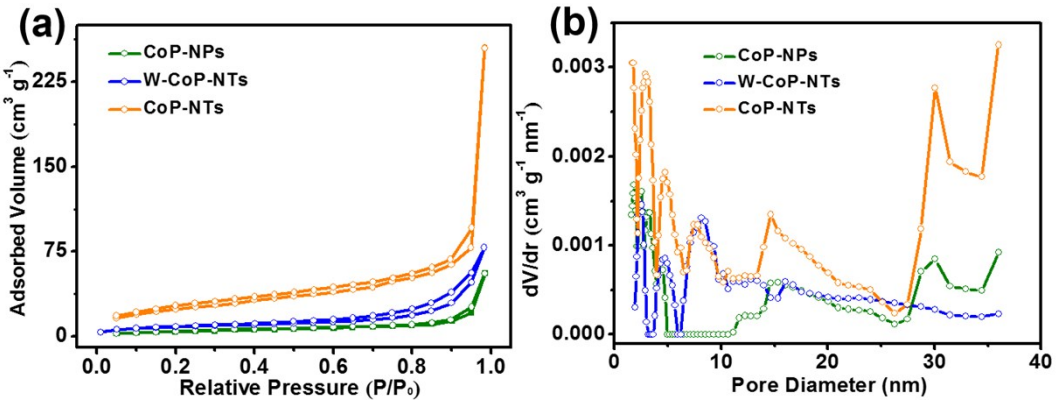

Fig. S5 (a) Nitrogen adsorption-desorption isotherms and (b) the corresponding pore size distribution plots of CoP-NPs, W-CoP-NTs and CoP-NTs.

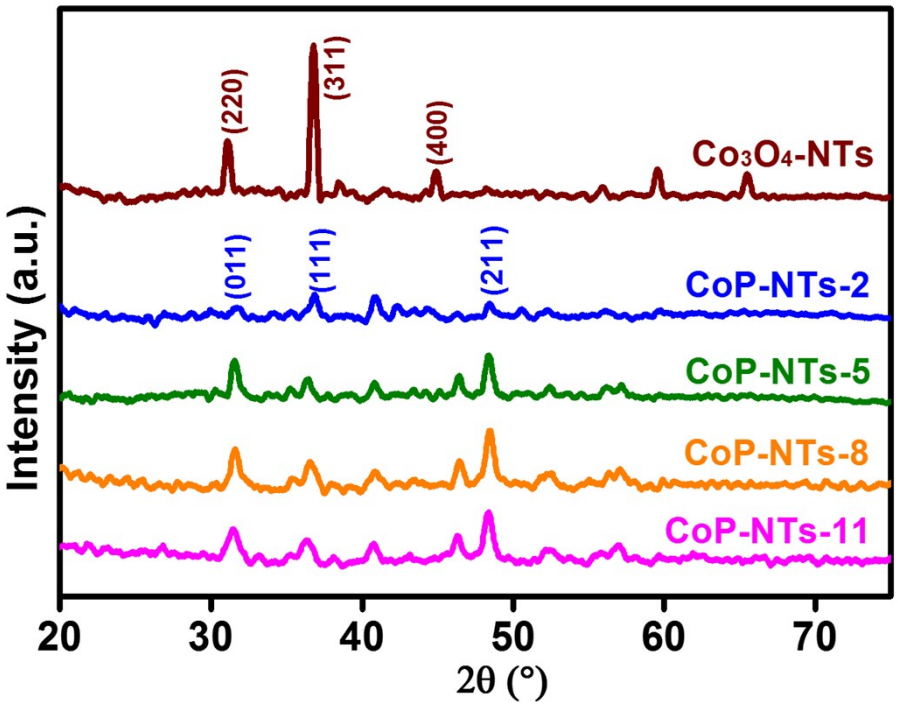

Fig. S6 X-ray diffraction patterns of Co_3O_4-NTs, CoP-NTs-2, CoP-NTs-5, CoP-NTs-8 and CoP-NTs-11, respectively.

Table. S1 Comparisons of the hydrogen evolution reaction performance for representative Co-based composites and other metal phosphide catalysts.

Catalyst	Loading mass (mg cm^{-2})	Onset overpotential (η, mV vs. RHE)	Tafel slope (b, mV dec^{-1})	Current density (j, mA cm^{-2})	η at the corresponding j (mV vs. RHE)	References
CoP nanoparticles	2	~	50	20	85	1
CoP@C nanocables	0.35	140	61	10	170	2
$Co_{0.6}Mo_{1.4}N_2$ bulk	0.24	~	~	10	200	3
$CoSe_2$ nanowire/carbon cloth	1.3	85	32	10	130	4
CoS_2 nanowire	1.7	75	51.6	10	145	5
Co/nitrogen-rich CNTs	0.28	50	69	10	260	6
CoS_2-MoS_2/CNTs	0.35	70	67	80	250	7
Co_9S_8@MoS_2/CNFs	0.212	64	110	10	190	8
Co-Te-Se nanocompound	0.42	169	42	10	217	9
FeP nanosheets	0.28	100	67	10	240	10
MoP nanoparticles	0.071	100	60	~	~	11
MoP nanosheet/carbon cloth	2.5	50	58	>10	124	12
Ni_2P nanosheet/Ni foam	3.5	80	68	15	120	13
WP_2 submicroparticles	0.5	54	57	10	161	14
CoP-NTs	0.35	53	50	10	152	This work

Notes: [a] CNTs represent carbon nanotubes; [b] CNFs represent carbon nanofibers.

References

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