Electronic Supplementary Information

Enhancement of alkaline water splitting activity by Co-P alloy coating on copper oxide nanowire

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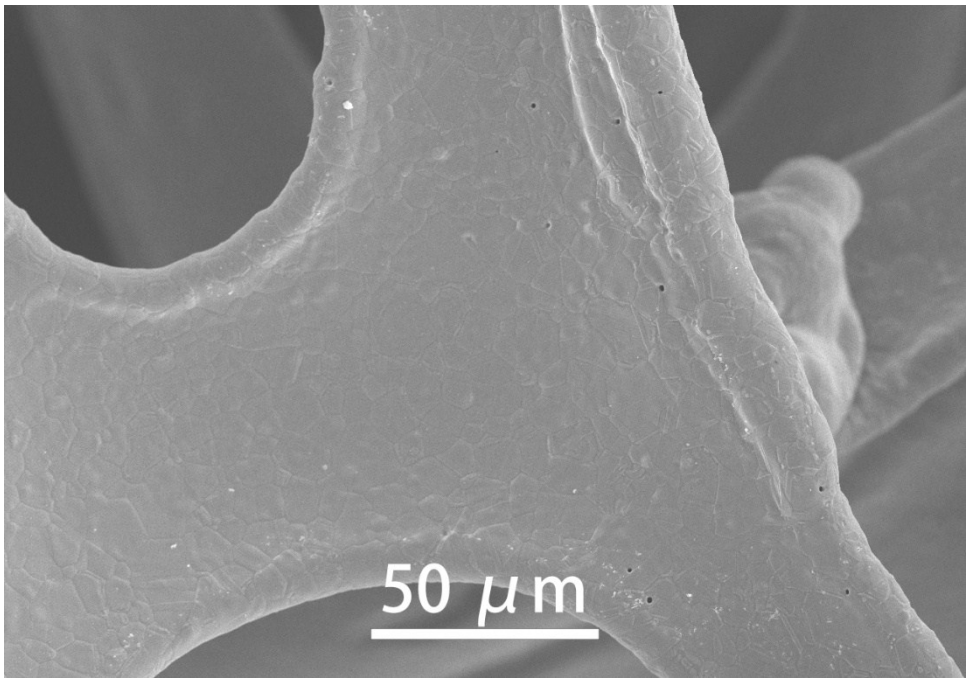

Fig. S1. SEM image of bare CF.

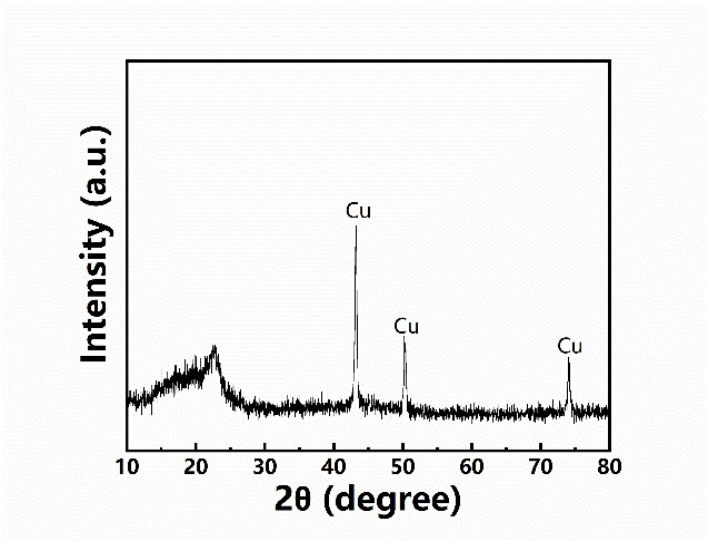

Fig. S2. XRD pattern of Co-P /CF (Co-P electrodeposit on bare CF).

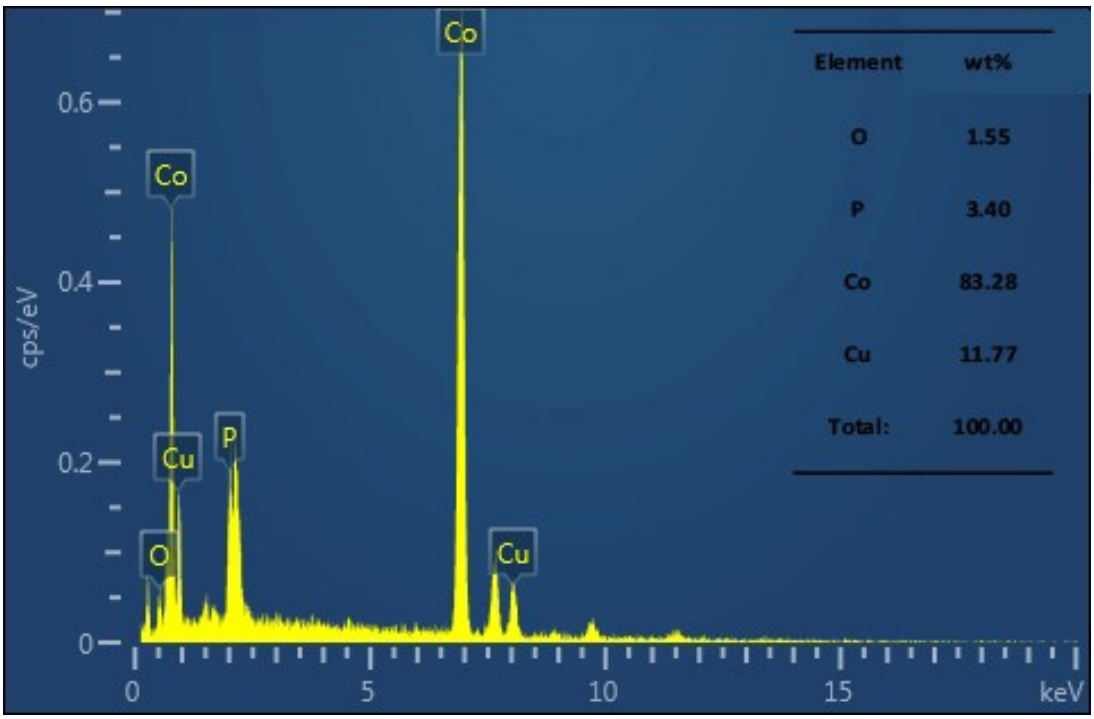

Fig. S3. EDX spectrum of Co-P/CuO CF.

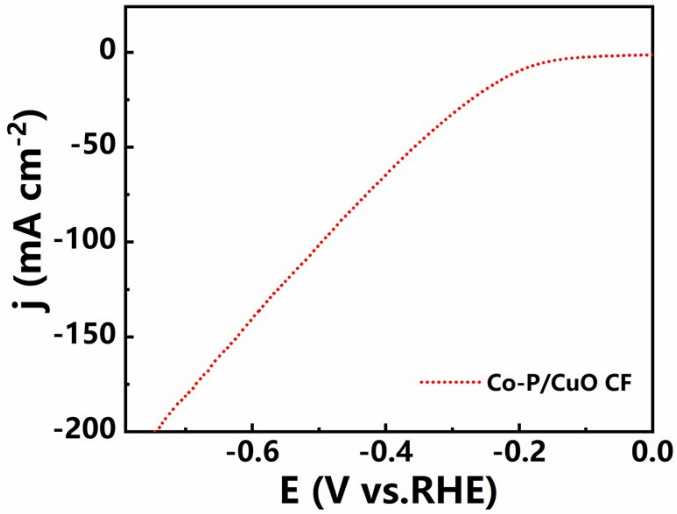

Fig. S4. HER performance of Co-P/CuO CF in 0.1 M PBS (pH=7.0).

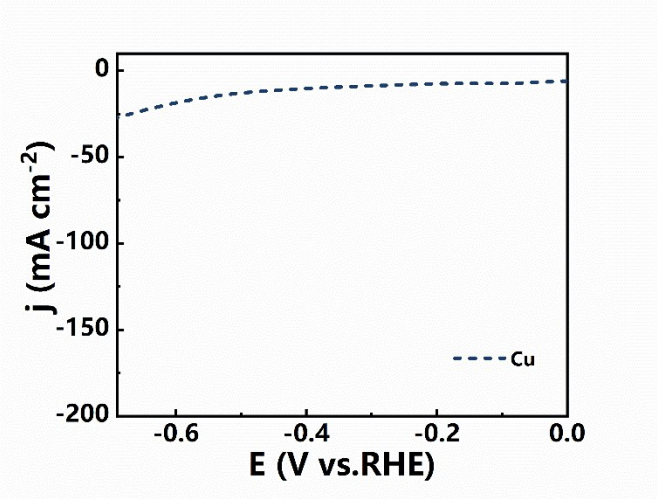

Fig. S5. HER performance of Cu foam in 1.0 M KOH.

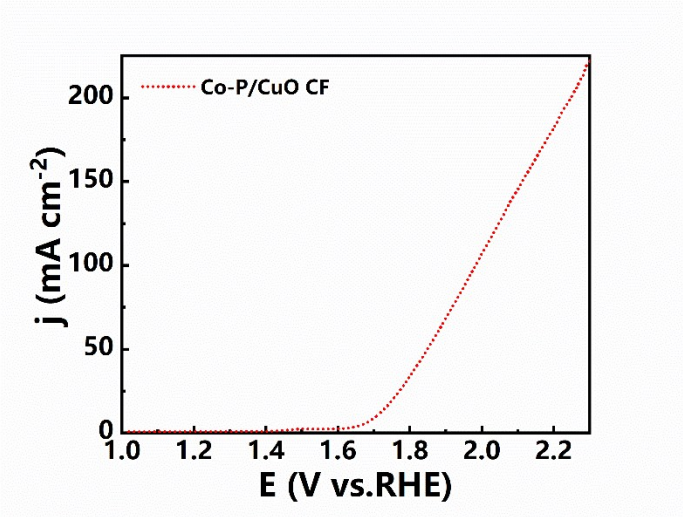

Fig. S6. OER performance of Co-P/CuO CF in 0.1 M PBS (pH=7.0).

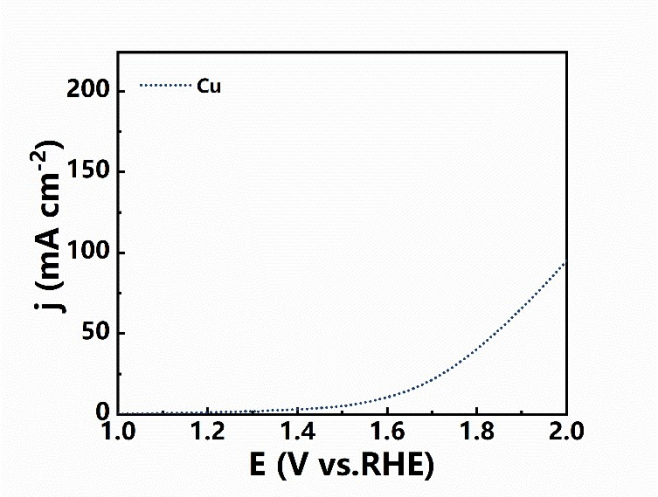

Fig. S7. OER performance of Cu foam in 1.0 M KOH.

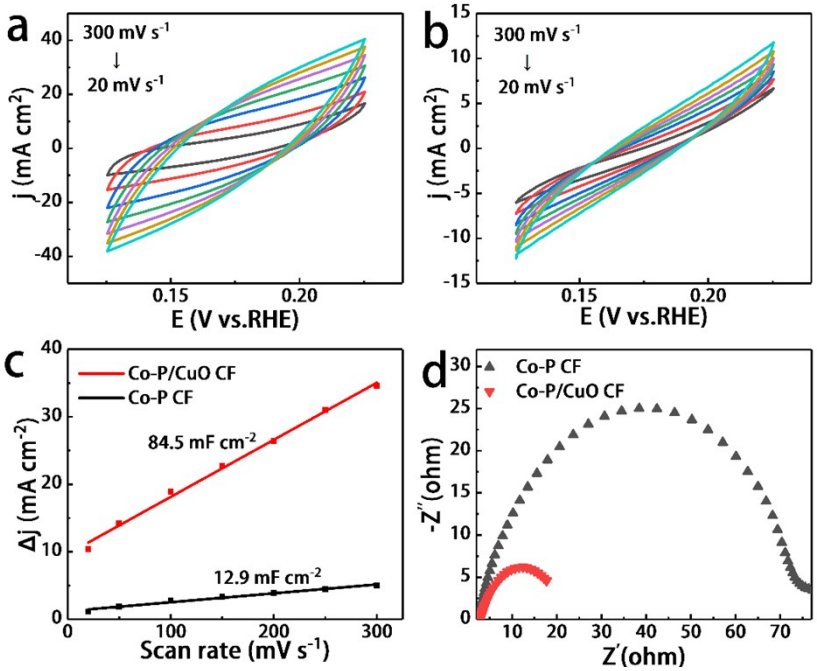

Fig. S8. CV curves for Co-P/CuO CF (a) and Co-P CF (b) at different scan rates: 20, 50, 100, 150, 200, 250 and 300 mV s^{-1} from inside to outside. (c) Capacitive current at 0.175 V (*vs.* RHE) as a function of the scan rate for Co-P/CuO CF and Co-P CF ($\Delta j = j_a - j_c$). (d) Nyquist plots for Co-P/CuO CF and Co-P CF in frequency of 0.1-100 KHz.

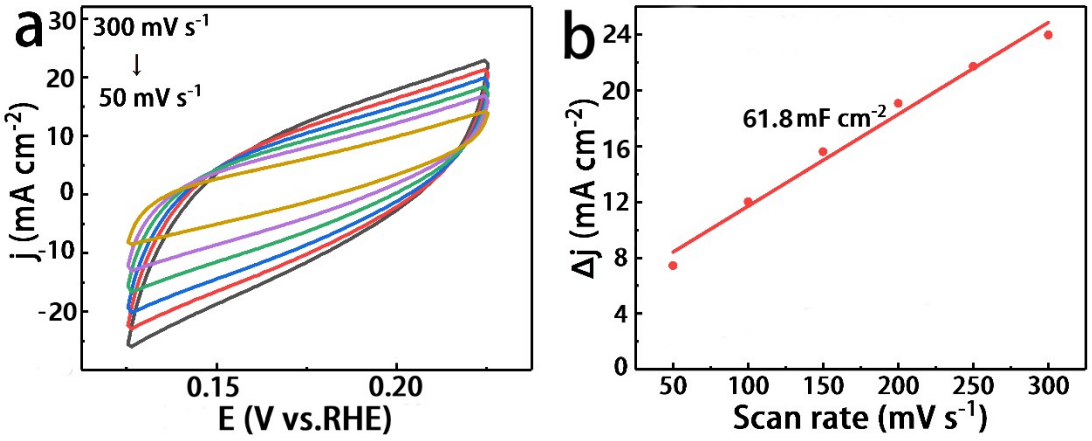

Fig. S9. (a) CV curves of Co-P/CuO CF after 30 h water electrolysis. (b) Corresponding pattern of scan rate *vs.* Δj.

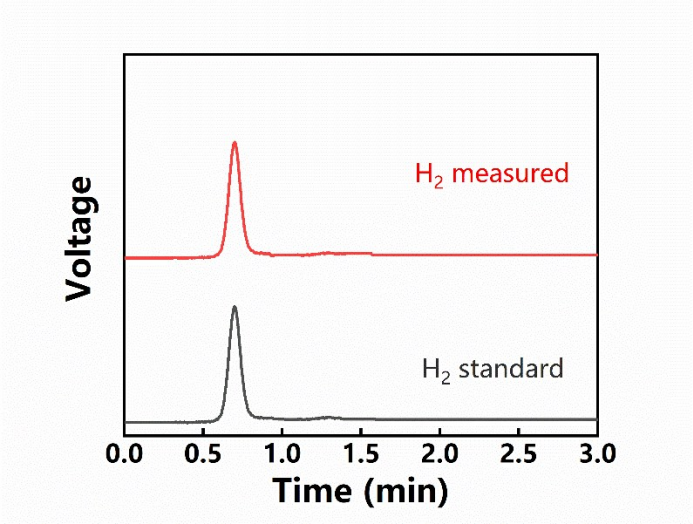

Fig. S10. GC patterns of H_2 production and H_2 standard gas (99%).

Table S1. Comparison of HER performance for Co-P/CuO CF with other non-noble-metal electrocatalysts in alkaline media.

Catalyst	j (mA cm^{-2})	η (mV)	Refs.
Co-P/CuO CF	20	95	This work
	50	102	
	100	112	
Co-P film	10	94	1
Co-S/FTO	10	480	2
Co-NRCNTs	10	370	3
	20	>450	
CoMnO@CN	28	100	4
CoO_x@CN	10	232	5
Co@N-C	10	210	6
CoP/CC	10	209	7
Ni-Co-S/CF	10	140	8
WP NA/CC	10	150	9
WP_2 submicroparticles	10	153	10
NiCo PBA nanocubes	10	150	11
Ni@NiO/Cr_2O_3	100	150	12
U-CNT-900	10	240	13
Co-NRCNT	10	370	14
MoC_x nano-octahedrons	10	150	15
MoS_2@Ni/CC	10	91	16
	100	196	

Table S2. Comparison of OER performance for Co-P/CuO CF with other non-noble-metal electrocatalysts in alkaline media.

Catalyst	j (mA cm^{-2})	η (mV)	Refs.
Co-P/CuO CF	10	259	This work
	20	292	
	50	329	
Co-P foam	10	300	17
Co-P film	10	345	18
NiCo LDH	10	367	19
CoCo LDH	10	393	20
Co_3O_4/rm-GO	10	310	21
CoxOy/NC	10	430	22
CoMn LDH	10	324	23
CoO/NG	10	340	24
$NiFeO_x$ film	10	350	25
Amorphous NiO	20	>470	26
NiO_x/C	10	335	27

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