Supporting Information

In situ construction of heterostructured Cu_xO@NiCoS nanoarrays for alkaline overall water splitting

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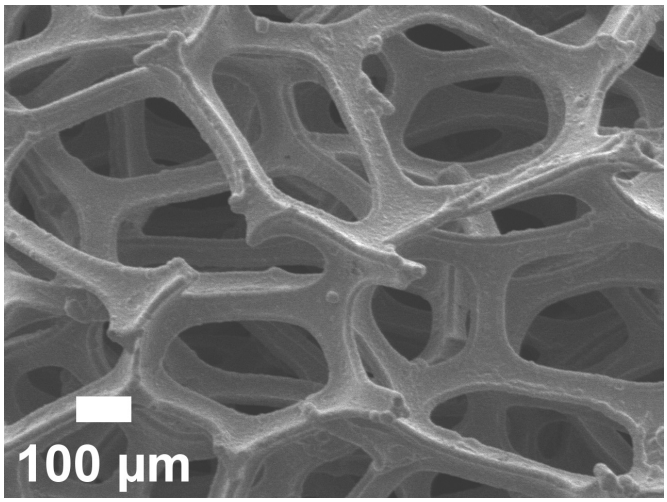

Fig. S1 SEM image of copper foam.

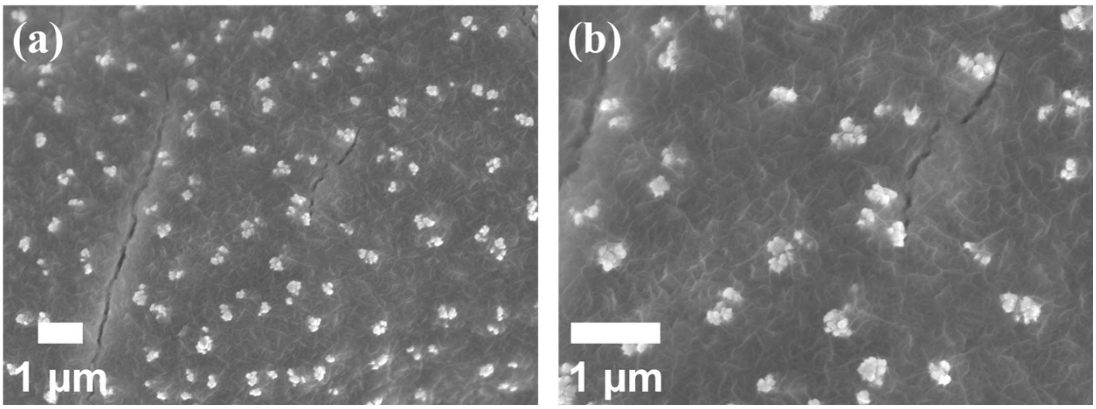

Fig. S2 SEM images of NiCoS/CF.

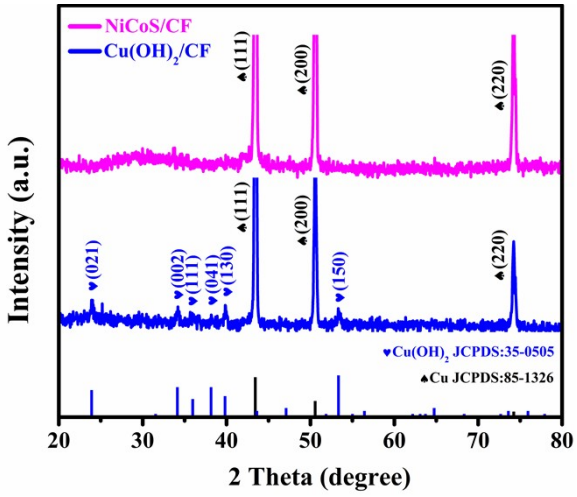

Fig. S3 XRD patterns of $Cu(OH)_2$/CF and NiCoS/CF.

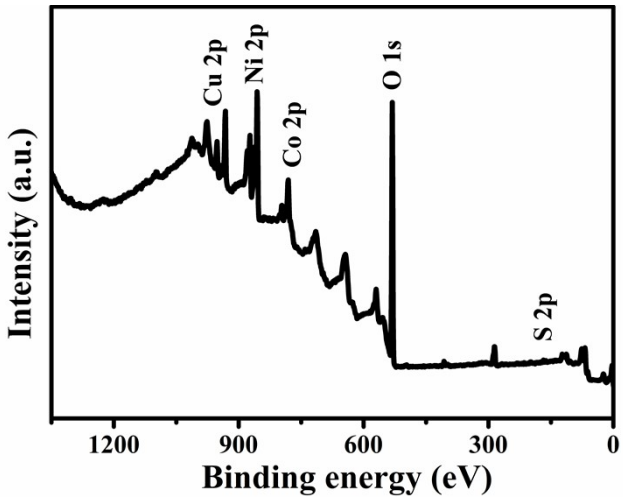

Fig. S4 XPS survey spectrum of Cu_xO@NiCoS-1/CF.

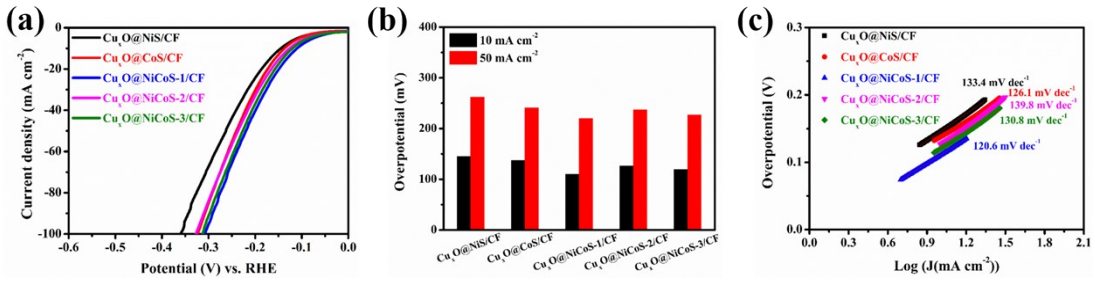

Fig. S5 (a) HER polarization curves, (b) Required overpotentials at a current density of 10 mA cm^{-2} and 50 mA cm^{-2} and (c) Tafel plots of samples with different initial metal source ratios.

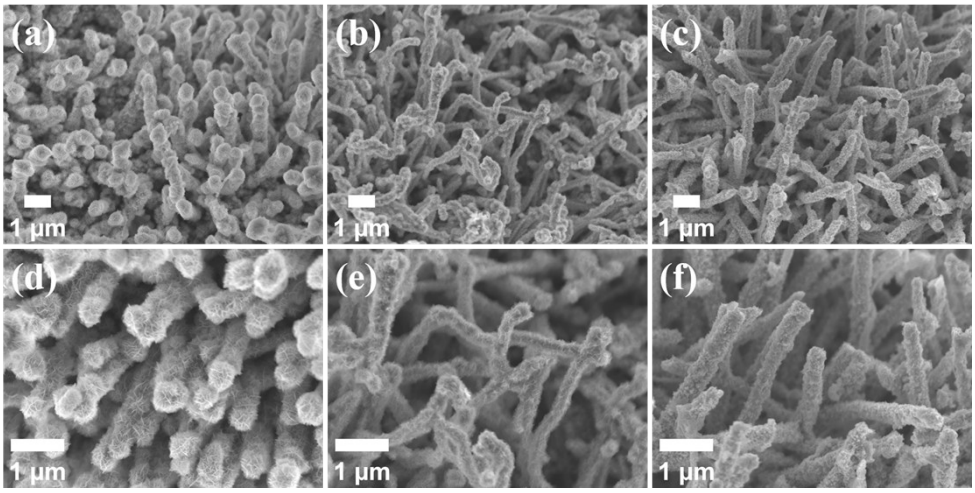

Fig. S6 SEM images of Cu_xO@NiCoS-1 (a and d), Cu_xO@NiCoS-2 (b and e) and

Cu_xO@NiCoS-3 (c and f).

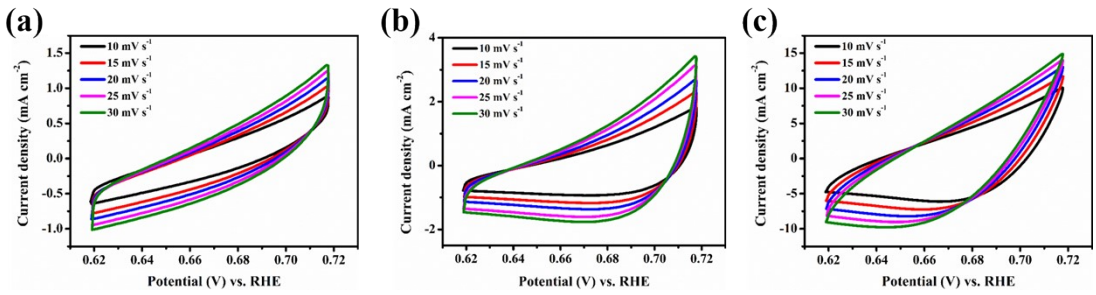

Fig. S7 Cyclic voltammetry curves of (a) Cu_xO/CF, (b) NiCoS/CF, (c) Cu_xO@NiCoS-1/CF in a potential range of 0.62 - 0.72 V (vs. RHE) with scan rates of 10, 15, 20, 25, 30 mV s^{-1}.

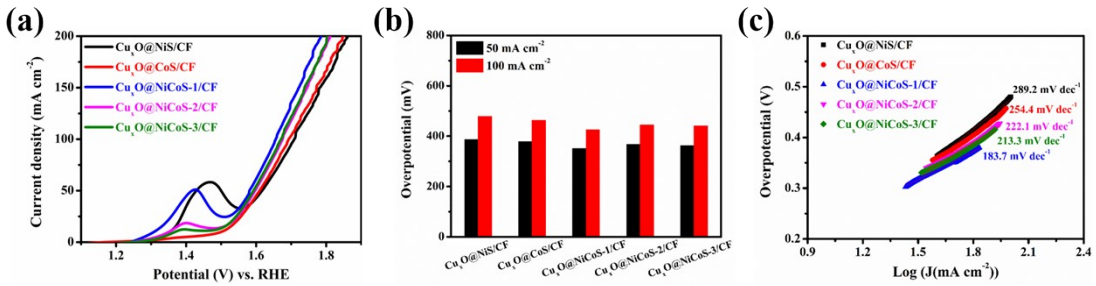

Fig. S8 (a) OER polarization curves, (b) Required overpotentials at a current density of 50 mA cm^{-2} and 100 mA cm^{-2} and (c) Tafel plots of samples with different initial metal source ratios.

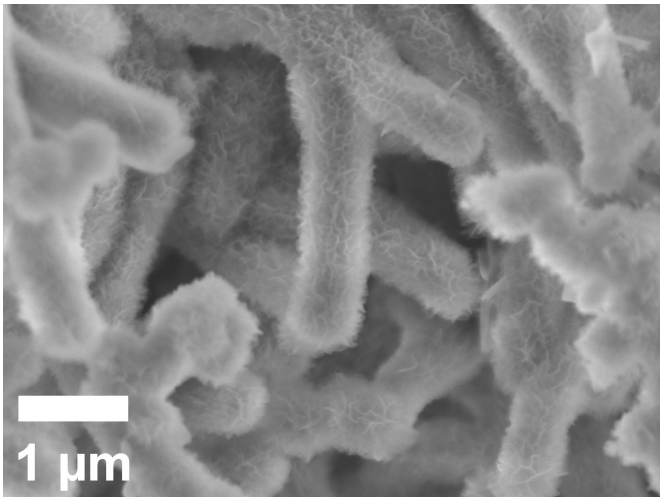

Fig. S9 SEM image of Cu_xO@NiCoS-1/CF after 60 h stability test.

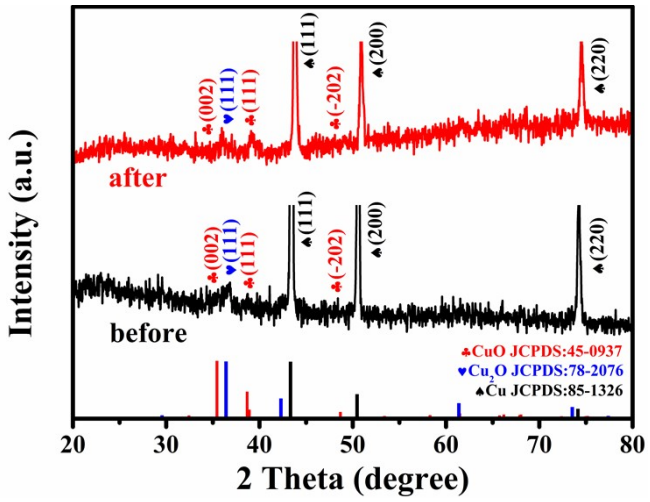

Fig. S10 XRD patterns of Cu_xO@NiCoS-1/CF before and after 60 h stability test.

Table S1 Comparison for overall water splitting performance of Cu_xO@NiCoS/CF in 1.0 M KOH with other recently reported electrocatalysts.

Electrode	Voltage@10 mA cm^{-2} (V)	Electrolyte	Reference
FeS_2/C/NF	1.72	1.0 M KOH	Dalton Trans. 2018, 47, 14917
CoP@NC	1.69	1.0 M KOH	Int. J. Hydrogen Energy 2021, 46, 2095-2102
Bi_2Se_3	1.9	1.0 M KOH	Ceram. Int. 2021, 47, 26484-26491
CNT@NiSe/SS	1.71	1.0 M KOH	J. Colloid Interface Sci. 2020, 574, 300-311
La-NiFe LDH	1.724	1.0 M KOH	Electrochim. Acta 2021, 390, 138824
$NiCoSe_2$@PCM	1.73	1.0 M KOH	J. Electroanal. Chem.

			2021, 897, 115568
Co/Mo_2C-NCNTs	1.72	1.0 M KOH	ChemCatChem 2020, 12, 3737-3745
$Ni_3S_4/NiS_2/FeS_2$	1.68	1.0 M KOH	Appl. Surf. Sci. 2021, 560, 149985
Cu_xO@NiCoS/CF	1.67	1.0 M KOH	This work