

Supporting information

# **Graphene Architecture-Supported Porous Cobalt–Iron Fluoride Nanosheets for Promoting the Oxygen Evolution Reaction**

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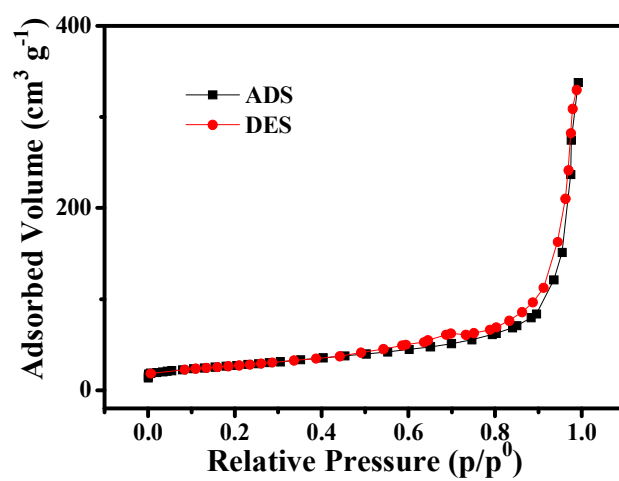


Figure S1 The nitrogen adsorption/desorption isotherms of CoFeF-GA.

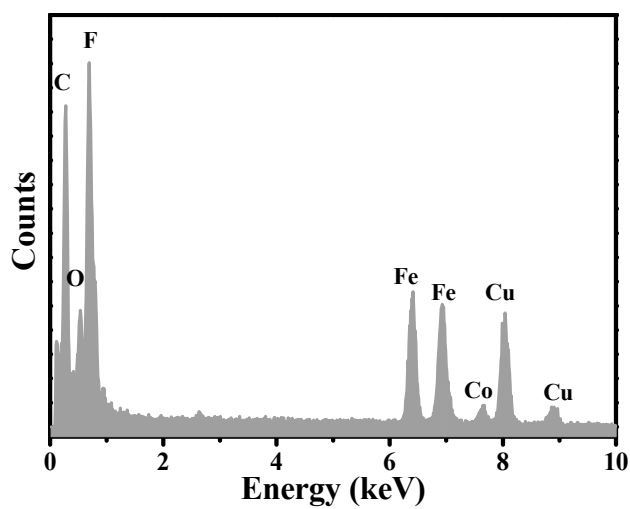


Figure S2 Energy dispersive X-ray spectroscopy of CoFeF-GA.

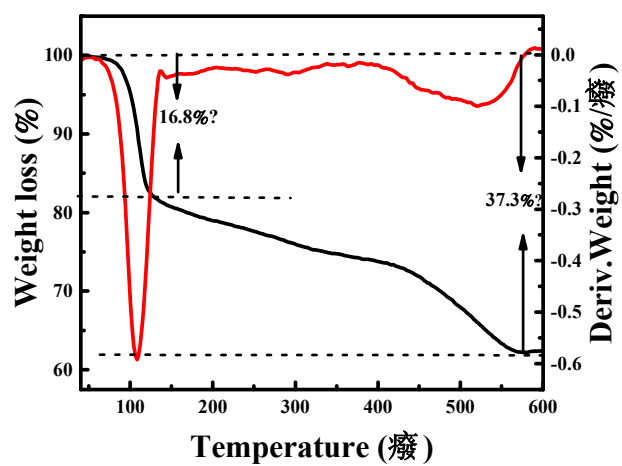


Figure S3 TGA full spectrum of the CoFeF-GA

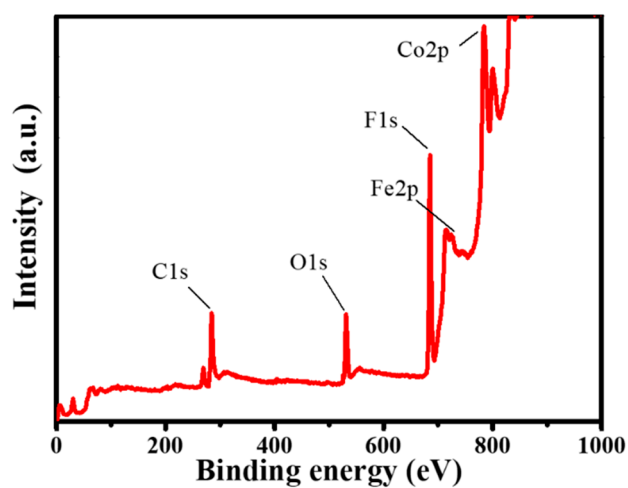


Figure S4 XPS full spectrum of the CoFeF-GA.

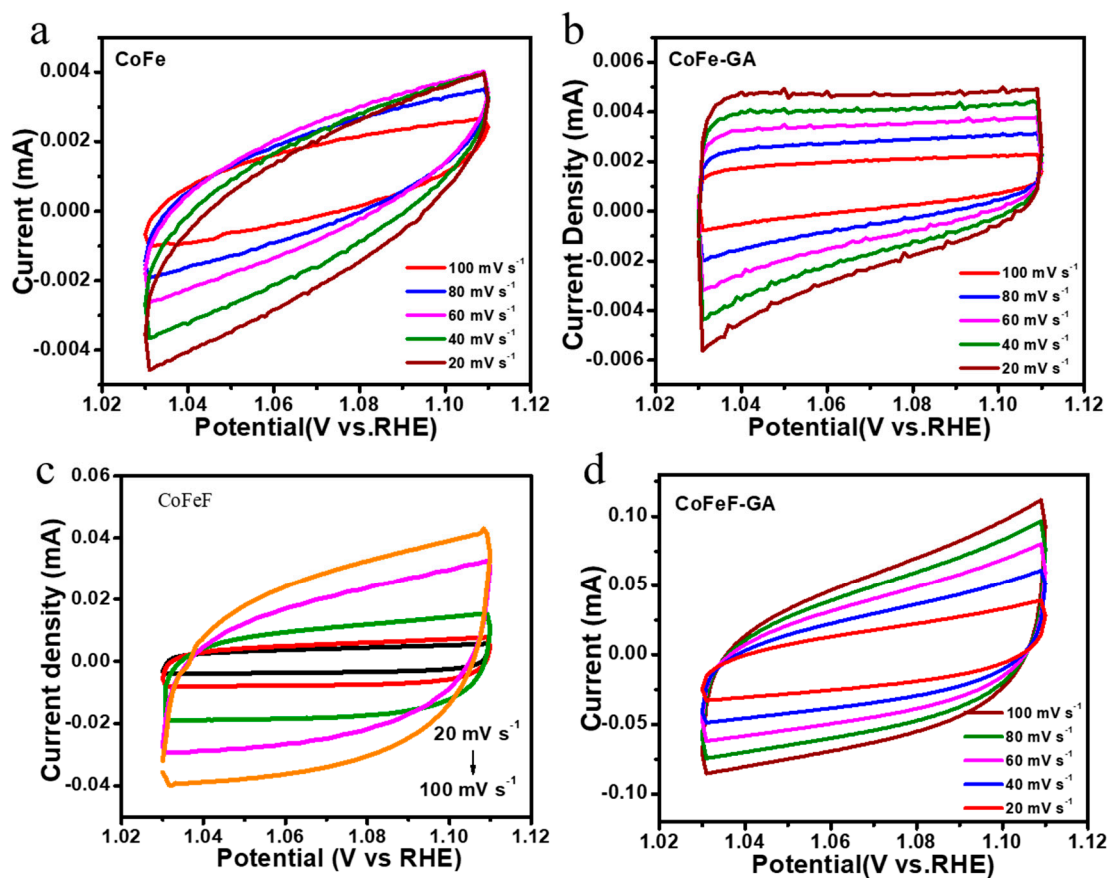


Figure S5 CV curves of (a) CoFe, (b) CoFe-GA, (c) CoFeF (d) CoFeF-GA in 1 M KOH at scan rates of 20, 40, 60, 80 and 100  $\text{mV s}^{-1}$ .

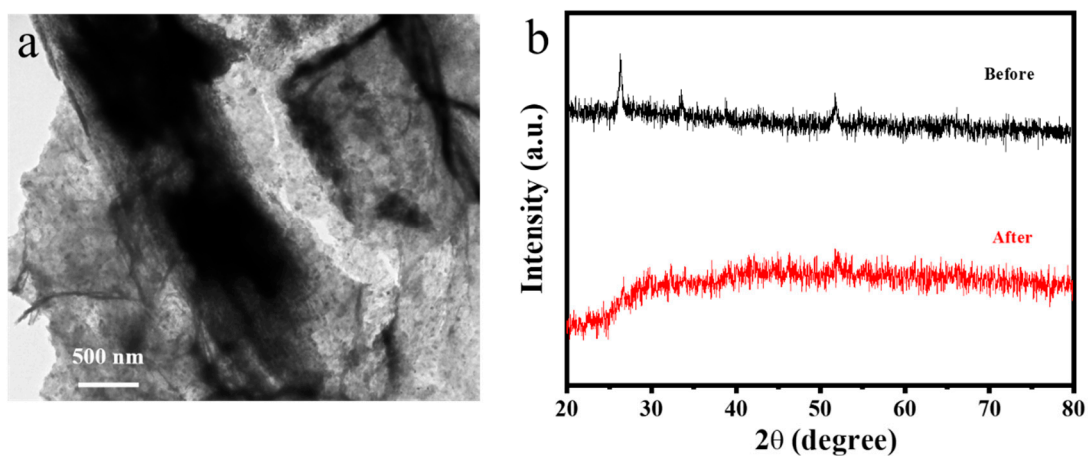


Figure S6 TEM image and XRD pattern of the CoFeF-GA catalyst after continuous CA test in 1.0 M KOH.

**Table S1** The comparison of other OER catalysts derived from transition metal-based materials in 1M KOH ( $\eta$ : overpotential at the current density of 10 mA cm<sup>-2</sup>)

Materials	Morphology	Overpotential (mV)	Ref
CoFeF-GA	Nanosheets	245	This work
NiCoFe-LDH/CFC	Nanosheets	280	[1]
KCo <sub>0.80</sub> Fe <sub>0.20</sub> F <sub>3</sub>	Nanocubics	254	[2]
Co <sub>0.3</sub> Ni <sub>0.3</sub> Fe <sub>0.2</sub> S NPs/C	Nanoparticles	266	[3]
Meso-NPC/Co <sub>2</sub> NiO <sub>x</sub>	Hollow spheres	330	[4]
Fe <sub>2</sub> CoZn <sub>9+9</sub> -NO/WC	Wrinkled-nanocake	290	[5]
NiFeP-WO <sub>x</sub>	Nanosheets- nanowires	270	[6]
Fe-Co@NSDC	Nanocages	296	[7]
(Fe, Co, Ni) <sub>9</sub> S <sub>8</sub> /NSCFs	Nanofibers	390	[8]
CNTAs-NG	Nanotubes	340	[9]
NiCoFe-LDH HP	Hollow polyhedron	276	[10]
Co(OH)F/Ni(OH) <sub>2</sub> @Fe(OH) <sub>3</sub> -D1	Core-shell	270	[11]

Table S2. The fitted  $R_s$ ,  $R_{ct}$  and  $R_1$  values of all catalysts.

Catalysts	$R_s/\Omega$	$R_{ct}/\Omega$	$R_1/\Omega$
CoFeF	8.01	44.9	4.07
CoFe	11.84	160.7	3.51
CoFe-GA	10.52	144.9	18.62
CoFeF-GA	9.53	17.74	1.74

Table S3. Detailed values of Cdl, ECSA and Rf of all catalysts.

Samples	$C_{dl}(\text{mF cm}^{-1})$	$ECSA(\text{cm}^2)$	$R_f$
CoFe	0.01	0.0175	0.25
CoFeF	0.32	0.56	8
CoFe-GA	0.03	0.0525	0.75
CoFeF-GA	0.50	0.875	12.5

## References

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