Supporting Information

Amorphous $CoFe(OH)_x$ hollow hierarchical structure: an efficient and durable electrocatalyst for oxygen evolution reaction

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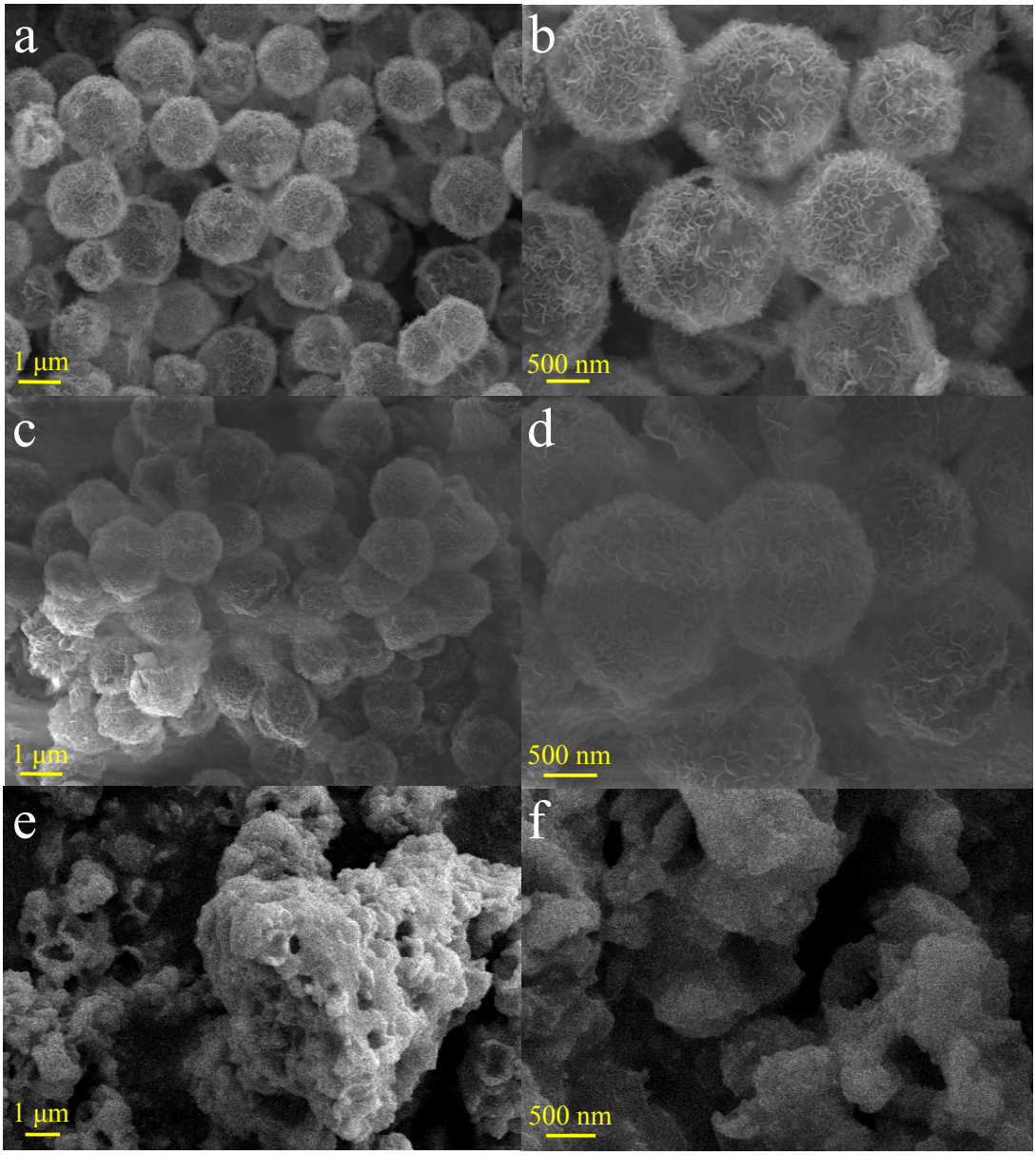

Fig. S1. The SEM images of (a, b) $Co(OH)_2$, (c, d) $CoFe(OH)_x$-1 and (e, f) $CoFe(OH)_x$-3.

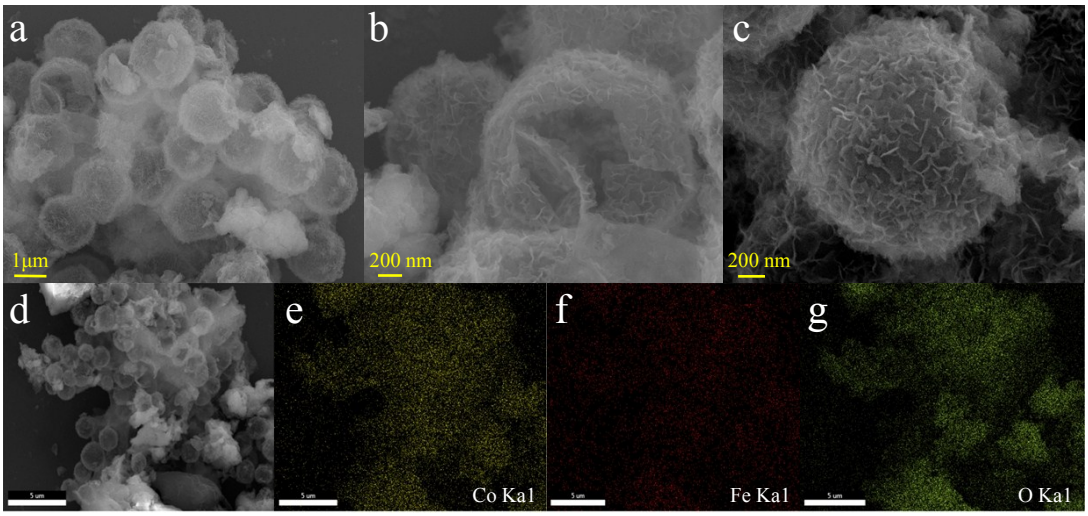

Fig. S2. The SEM images of $CoFe(OH)_x$ and its elemental mapping images of Co, Fe and O.

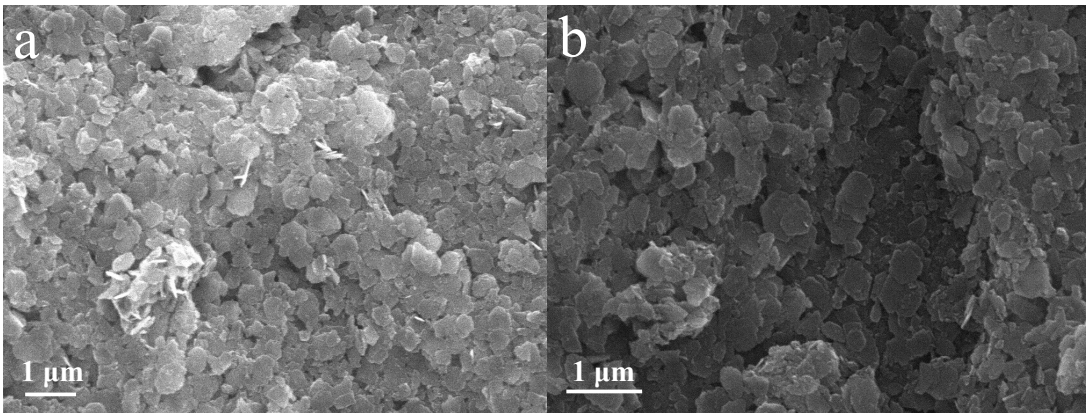

Fig. S3. SEM images of *p*-$Co(OH)_2$.

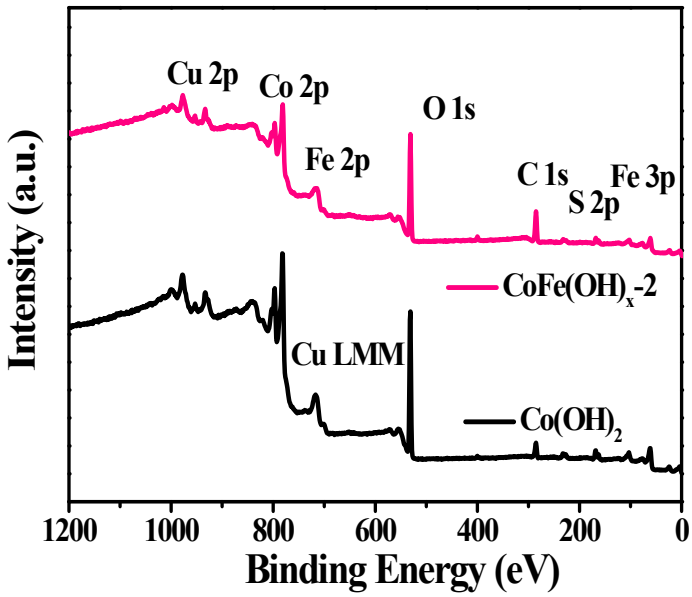

Fig. S4. XPS survey spectra of the as-prepared $CoFe(OH)_x$-2 and $Co(OH)_2$.

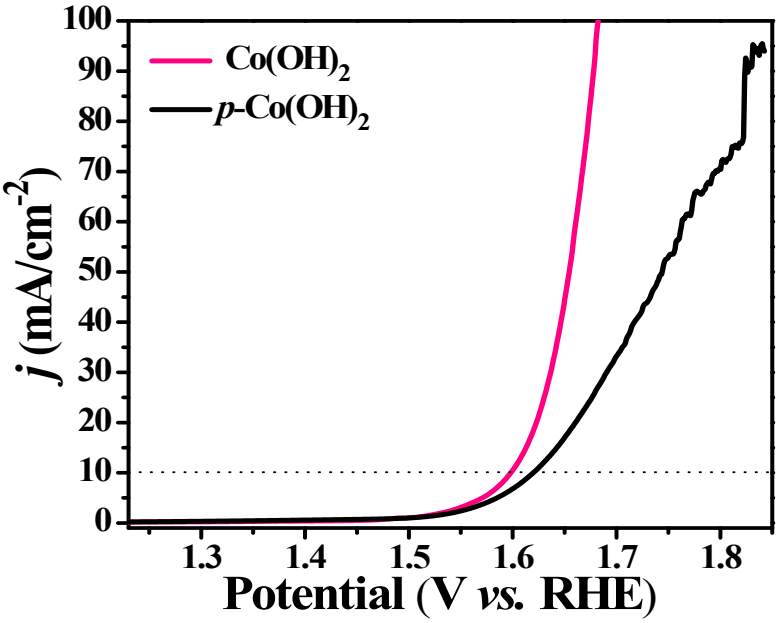

Fig. S5. LSV curves of $Co(OH)_2$ and *p*-$Co(OH)_2$.

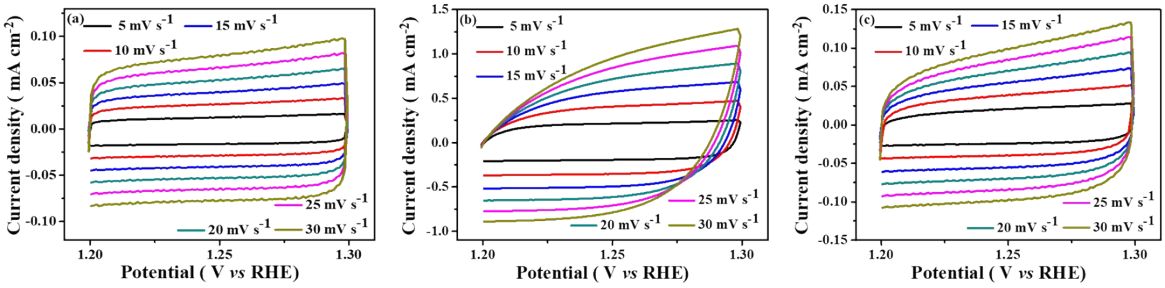

Fig. S6. CV curves of (a) $Co(OH)_2$, (b) $CoFe(OH)_x$-1, and (c) $CoFe(OH)_x$-3 at different scan rates.

Table S1. The elemental contents of as-prepared samples measured by ICP and elemental analysis.

Sample	Elemental contents				
	Co (wt%)	Fe (wt%)	Cu (wt%)	S (wt%)	Co:Fe (molar ratio)
p-$Co(OH)_2$	58.10	-	-	-	
$Co(OH)_2$	49.88	-	3.23	5.17	
$CoFe(OH)_x$-1	47.26	2.69	3.18	5.21	16.65:1
$CoFe(OH)_x$-2	45.12	4.89	3.08	5.33	8.74:1
$CoFe(OH)_x$-3	39.96	9.97	3.11	4.98	3.80:1

Table S2. A comparison of the OER performances of the as-prepared $CoFe(OH)_x$-2 with the state-of-the-art Co, Fe, Ni-based OER electrocatalysts reported previously.

Electrocatalysts	Eletrode	η_{10} (mV) (eletrolyte)	Tafel slope (mV dec^{-1})	*Ref.* *Year*	*Published Journal*
$Ni_{0.71}Fe_{0.29}(OH)_x$	Graphite electrode	296 (1M KOH)	58	[22]2016	*Nanoscale*
NiFeCr LDH	GC	280	~130	[18]2018	*Adv. Energy Mater.*
$NiCo(OH)_x$	Stainless steel foil	~255 (1M KOH)	24	[20] 2017	*ACS Appl. Mater. Interfaces*
CoFe hydroxide	Ni foam	220 (1M KOH)	40	[16] 2018	*Small*
CoFe-Bi@CoFe-LDH	Ti mesh	418 (Neutral electrolyte)	131	[S1] 2018	*ACS Sustain. Chem. Eng.*
$CoFePi/Ni(PO_3)_2$	Carbon cloth	213 (1M KOH)	39	[24] 2018	*J. Mater. Chem. A*
FeCo-P/C	Glassy carbon	360 (1M KOH)	58.4	[S2] 2018	*Small*
$CoFe_2O_4$	Carbon fiber papers	378 (1M KOH)	73	[S3] 2017	*ACS Appl. Mater. Interfaces*
CoFe LDH-F	Glassy carbon	300 (1M KOH)	40	[S4] 2016	*ACS Appl. Mater. Interfaces*
S-NiCoFe LDH	Carbon cloth	206 (1M KOH)	46	[15] 2018	*J. Mater. Chem. A*
Cu@CoFe LDH	Cu foam	240 (1M KOH)	44.4	[S5] 2017	*Nano Energy*
$CoFe(OH)_x$-2	Glassy carbon	293 (1M KOH)	67.4	\	This work

Reference

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