Supplementary Materials

Synthesis of Cobalt-Doped Iron Phosphate Crystal on Stainless Steel Mesh for Corrosion Resisted Oxygen Evolution Catalyst

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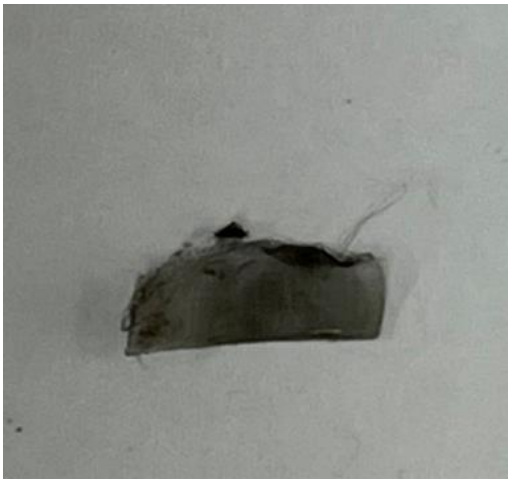

Figure S1. Picture of SSM that corroded away after the hydrothermal reaction in 4.14 wt % H_3PO_4 solution, except for the part inserted into a homemade Teflon holder.

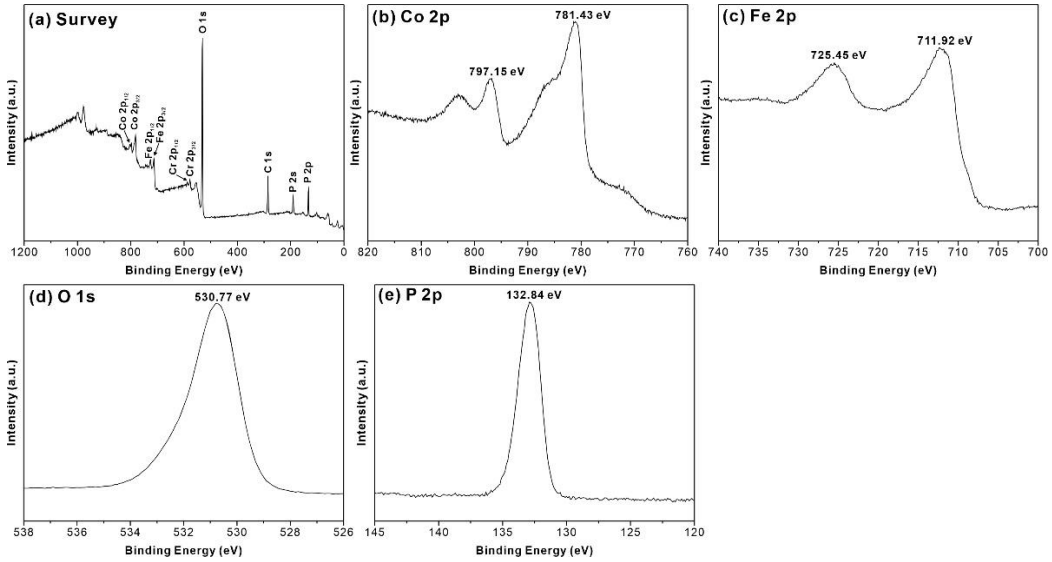

Figure S2. (a) XPS survey spectrum for iron phosphate oxide hydroxide crystal. (b-f) XPS spectra of iron phosphate oxide hydroxide crystal in the (b) Co 2p, (c) Fe 2p, (d) O 1s, and (e) P 2p.

Table S1. Comparison of OER activity of 0.84-CoFePi with recently reported Co and Fe based catalysts.

Catalysts	substrate	Electrolyte	Overpotential (mV) @ 10 $mAcm^{-2}$	Reference
0.84-CoFePi	Stainless steel mesh	1 M KOH	300.3	This work
Amorphous α-phase NiCo hydroxide	Stainless steel foil (planar)	1 M KOH	257	[1]
Amorphous α-phase $Ni(OH)_2$			273	
Amorphous α-phase $Co(OH)_2$			305	
Co_xO_y/NC	Nitrogen-doped carbon	0.1 M KOH	430	[2]
PE-Co_3O_4NS/Ti	Ti foil	0.1 M KOH	300	[3]
Fe adsorbed CoO_x	Glassy-carbon-disk	1 M KOH	309	[4]
Mn-Co LDH/Graphene	Graphene	1 M KOH	330	[5]
CoFeP@C	N, P dual-doped carbon matrix	1 M KOH	336	[6]
CoNi-CoO@NC/CP	Carbon paper	0.1 M KOH	392	[7]

1. Balram, A.; Zhang, H.; Santhanagopalan, S. Enhanced Oxygen Evolution Reaction Electrocatalysis via Electrodeposited Amorphous α-Phase Nickel-Cobalt Hydroxide Nanodendrite Forests. *ACS Appl. Mater. Interfaces* **2017**, 9, 28355-28365.
2. Masa, J.; Xia, W.; Sinev, I.; Zhao, A.; Sun, Z.; Grützke, S.; Weide, P.; Muhler, M.; Schuhmann, W. Mn_xO_y/NC and Co_xO_y/NC Nanoparticles Embedded in a Nitrogen-Doped Carbon Matrix for High-Performance Bifunctional Oxygen Electrodes. *Angew. Chem. Int. Ed.* **2014**, 53, 8508-8512.
3. Xu, L.; Jiang, Q.; Xiao, Z.; Li, X.; Huo, J.; Wang, S.; Dai, L. Plasma-Engraved Co_3O_4 Nanosheets with Oxygen Vacancies and High Surface Area for the Oxygen Evolution Reaction. *Angew. Chem. Int. Ed.* **2016**, 55, 5277-5281.
4. Gong, L.; Chng, X.Y.E.; Du, Y.; Xi, S.; Yeo, B.S. Enhanced Catalysis of the Electrochemical Oxygen Evolution Reaction by Iron(III) Ions Adsorbed on Amorphous Cobalt Oxide. *ACS Catal.* **2018**, 8, 807-814.
5. Bao, J.; Xie, J.; Lei, F.; Wang, Z.; Liu, W.; Xu, L.; Guan, M.; Zhao, Y.; Li, H. Two-Dimensional Mn-Co LDH/Graphene Composite towards High-Performance Water Splitting. *Catalysts* **2018**, 8, 350.
6. Gao, L.; Chang, S.; Zhang, Z. High-Quality CoFeP Nanocrystal/N, P Dual-Doped Carbon Composite as a Novel Bifunctional Electrocatalyst for Rechargeable Zn–Air Battery. *ACS Appl. Mater. Interfaces* **2021**, 13, 22282-22291.
7. Ao, K.; Daoud, W.A. Facile controlled formation of CoNi alloy and CoO embedded in N-doped carbon as advanced electrocatalysts for oxygen evolution and zinc-air battery. *Electrochim. Acta* **2021**, 395, 139204.