Supporting information

Self-templated fabrication of P-doped $CoMoO_4$-Co_3O_4 hollow nanocages for the efficient oxygen evolution reaction

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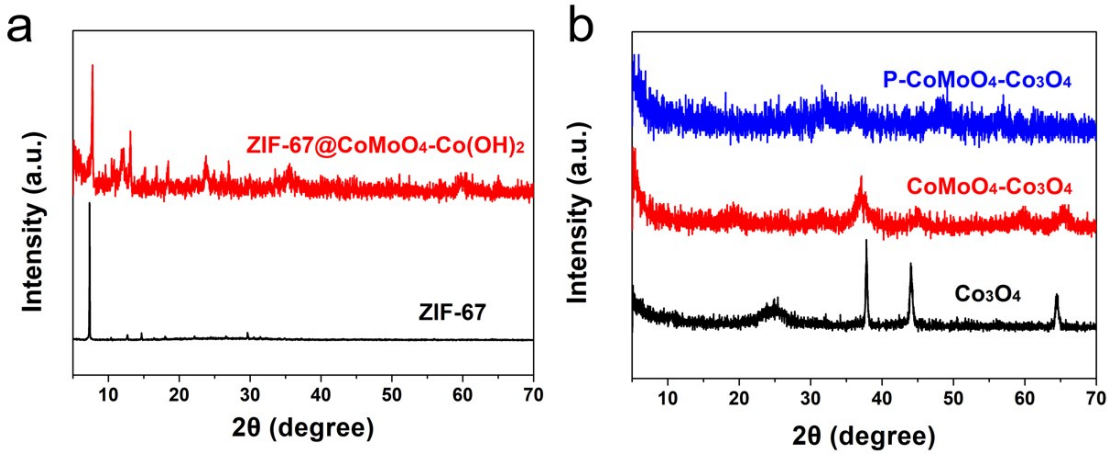

Fig. S1 XRD patterns of prepared samples. a) ZIF-67 and ZIF-67@$CoMoO_4$-$Co(OH)_2$, b) Co_3O_4, $CoMoO_4$-Co_3O_4 and P-$CoMoO_4$-Co_3O_4.

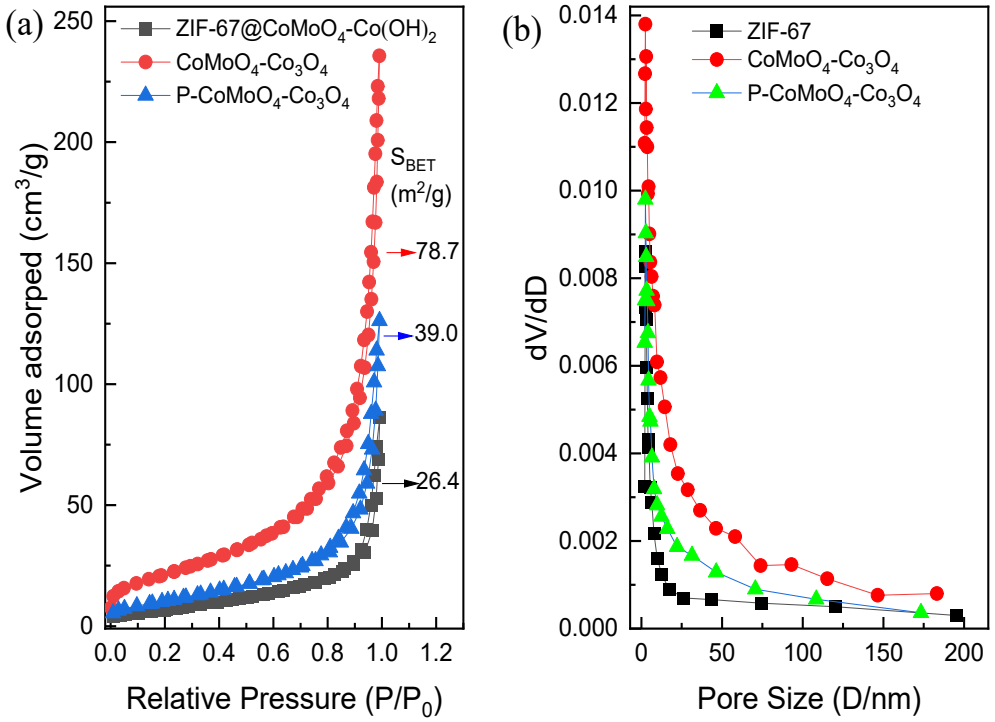

Fig. S2 (a) N_2 adsorption-desorption isotherms, BET areas, (b) pore diameter distribution of ZIF-67@$CoMoO_4$-$Co(OH)_2$, $CoMoO_4$-Co_3O_4 and P-$CoMoO_4$-Co_3O_4.

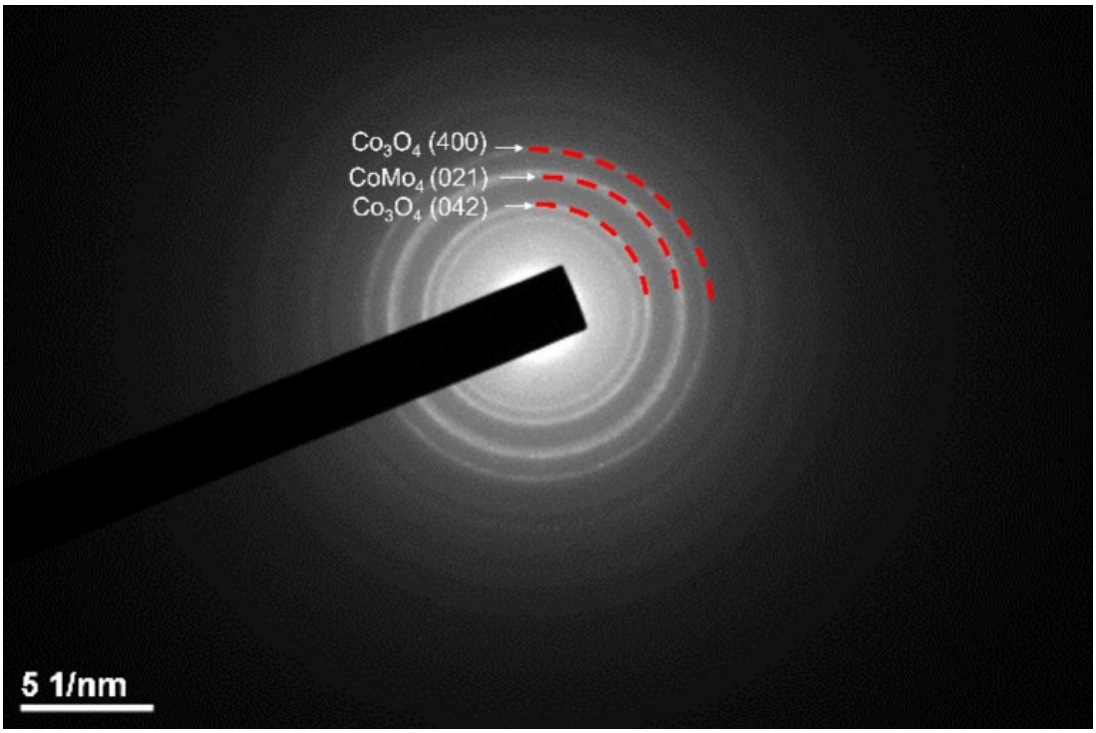

Fig. S3 SAED pattern of P-$CoMoO_4$-Co_3O_4.

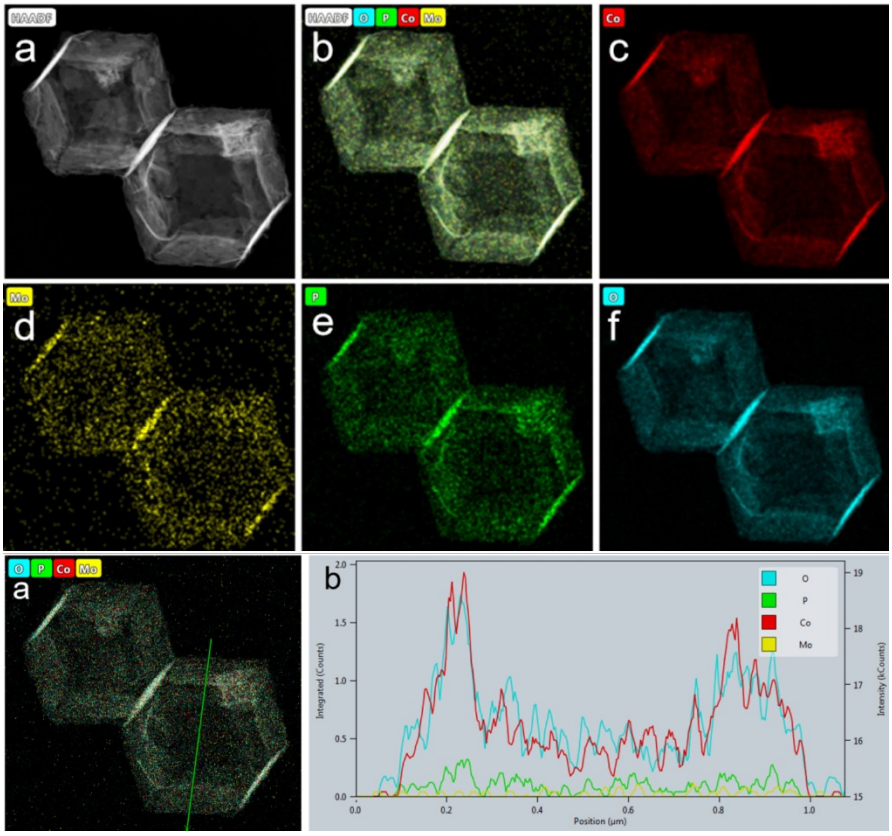

Fig. S4 EDX cross-sectional line scan profiles of the of P-$CoMoO_4$-Co_3O_4.

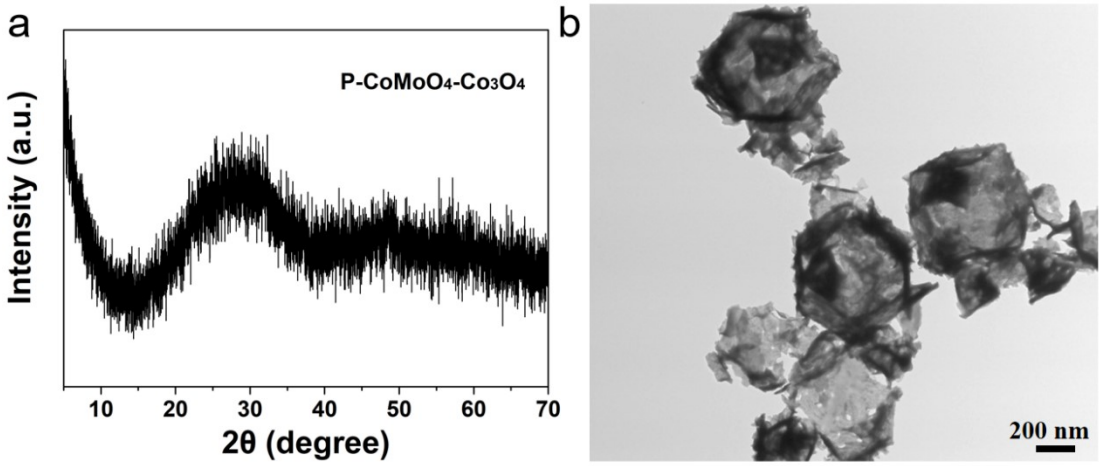

Fig. S5 XRD patterns and TEM images of the used P-Co_3O_4/$CoMoO_4$ HNC.

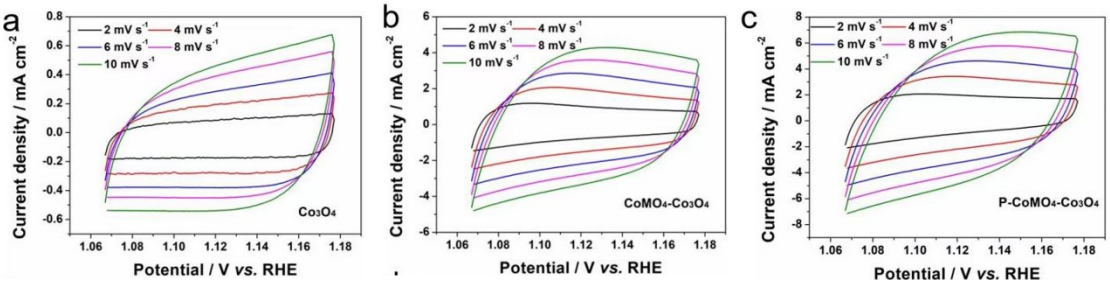

Fig. S6 Cyclic voltammetry of a) Co_3O_4, b) $CoMoO_4$-Co_3O_4 and c) P-$CoMoO_4$-Co_3O_4 and d) Values of the electrochemical double layer capacitance (*C*dl).

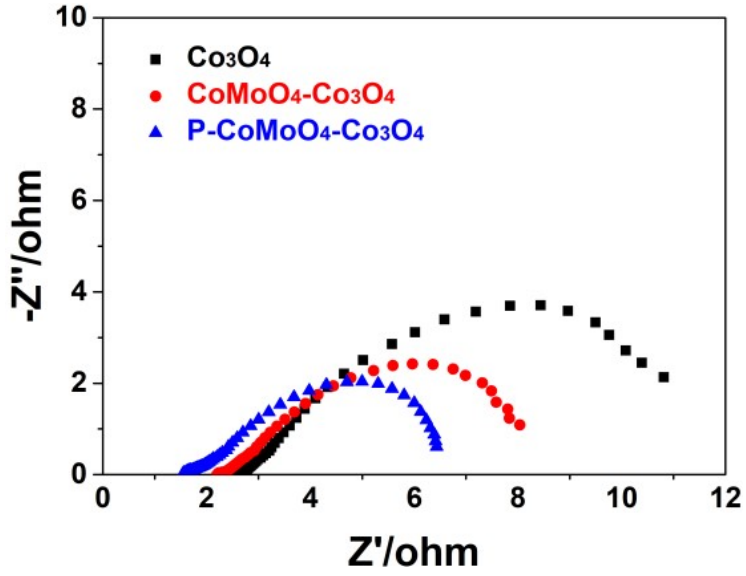

Fig. S7 EIS Nyquist diagram of Co_3O_4, $CoMoO_4$-Co_3O_4 and P-$CoMoO_4$-Co_3O_4.

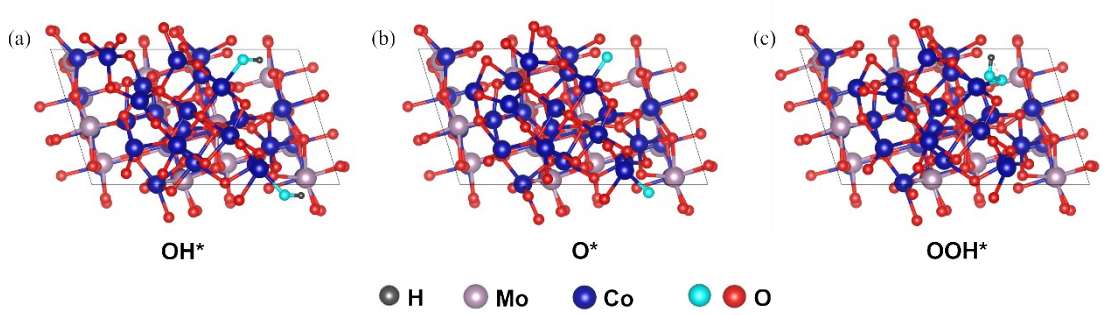

Fig. S8 The top view and side view of the (a) OH*, (b) O*and (c) OOH* structures on $CoMoO_4$-Co_3O_4 in OER.

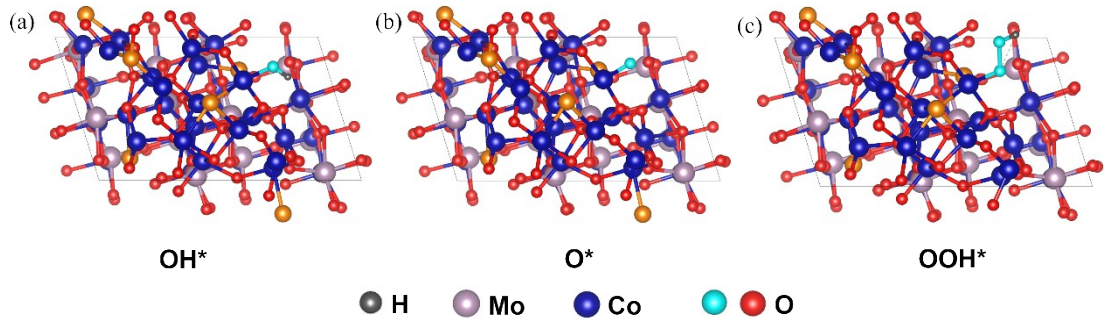

Fig. S9 The top view and side view of the (a) OH*, (b) O*and (c) OOH* structures on P-$CoMoO_4$-Co_3O_4 in OER.

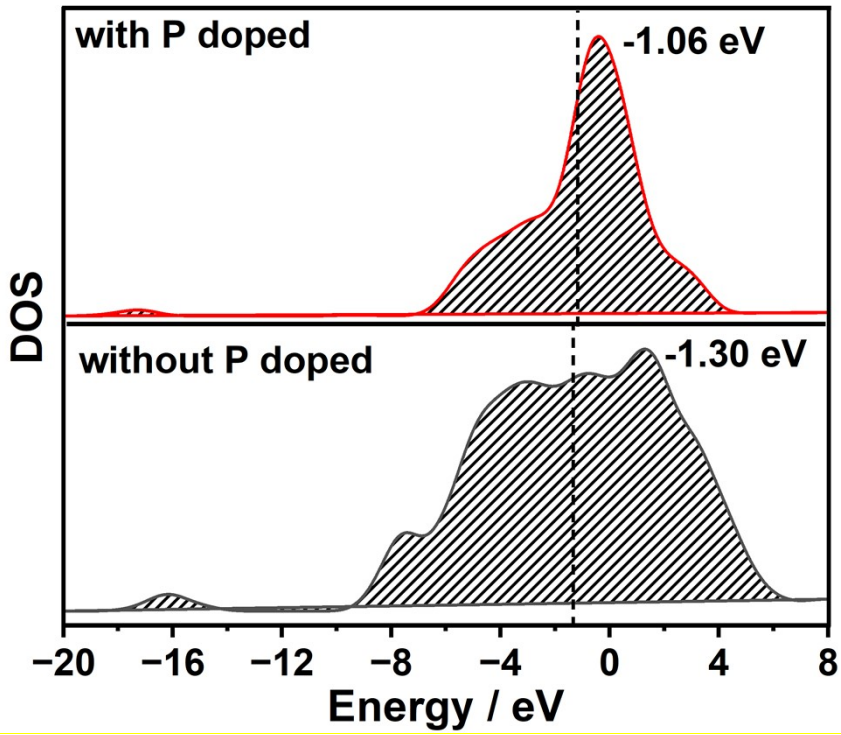

Fig. S10. Calculated density of states (DOS) of Co-3d in P-$CoMoO_4$-Co_3O_4 and $CoMoO_4$-Co_3O_4.

Table S1 OER performances comparison of recently reported representative electrocatalysts in alkaline medium (1.0 M KOH, at 10 mA cm^{-2}).

Catalyst	Overpotential (mV)	Reference
P-$CoMoO_4$-Co_3O_4	279	This work
Co/CoP	340	[1] Adv. Energy Mater. 7 (2017) 1602355.
$Ni_3ZnC_{0.7}$/NCNT-700	380	[2] Carbon 148 (2019) 496−503.
CoNiP/CoNi	300	[3] ChemSusChem 14(2021) 1921−1935.
N doped NiS/NiS_2	270	[4] Chem. Eng. J. 397 (2020) 125507.
MnCo@NiS	286	[5] J. Power Sources 489 (2021) 229525.
Mn_{13}-NS/NF(Ni foam)	357	[6] ACS Appl. Nano Mater. 5 (2022) 326−330.
NiOOH/Ni_3S_2/NF	255	[7] Mater. Today Energy (2022) 101008.
Ni_2P-Ni_3S_2 HNAs/NF	210	[8] ACS Catal. 8 (2018) 8107−8114.
Ni(Co)(Fe)OxHy	278	[9] Nano Res. 12 (2019) 2288−2295.
NiS/Ni interface	301	[10] J. Mater. Sci. Technol. 42 (2020) 10−16.