Supporting Information

Mesoporous K-doped $NiCo_2O_4$ derived from Prussian blue analog: High-yielding synthesis and assessment as oxygen evolution reaction catalyst

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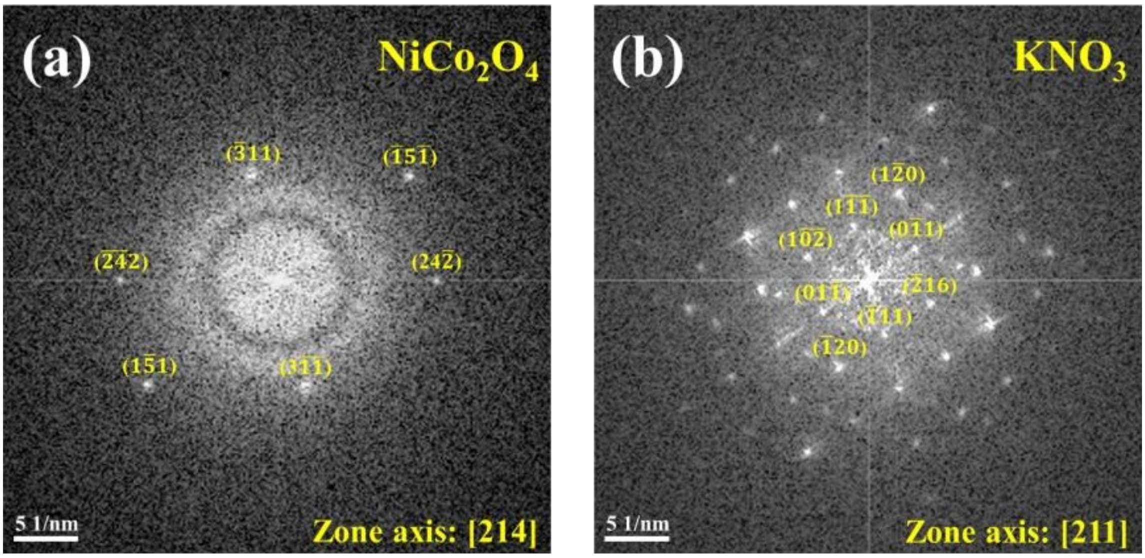


Figure S1. Fast Fourier transform patterns of (a) $NiCo_2O_4$ (white rectangle in Fig. 1b) and (b) KNO_3 (red rectangle in Fig. 1b).

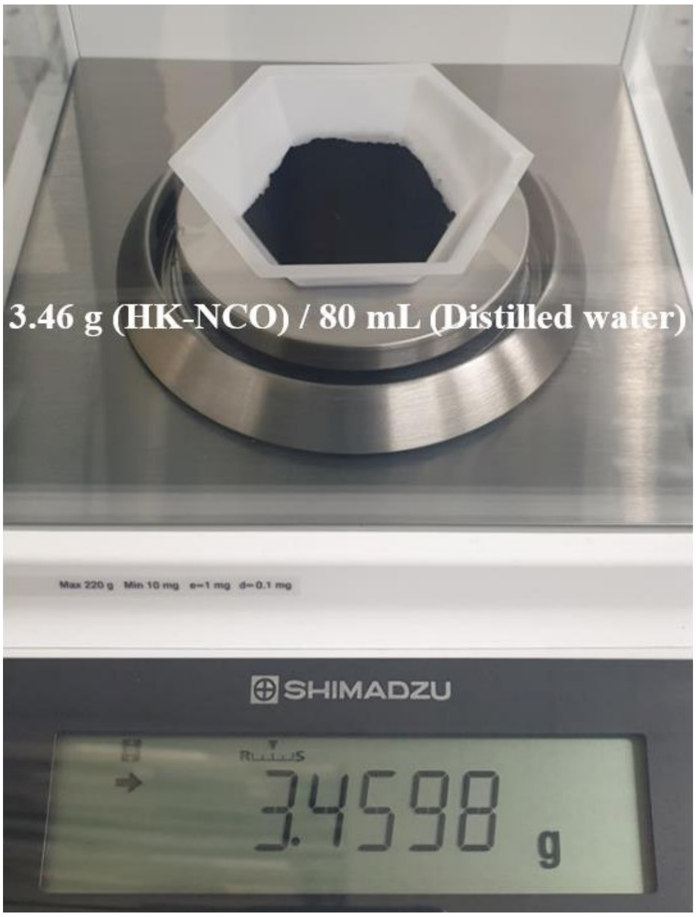


Figure S2. Weighing the HK-NCO catalyst powder produced by hydrothermal synthesis.

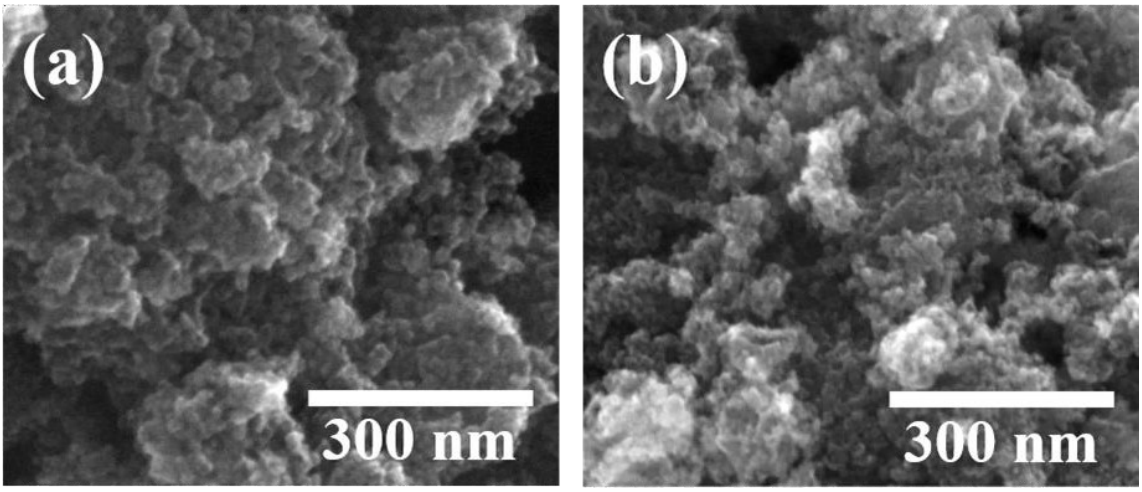


Figure S3. SEM images of catalysts prepared (a) hydrothermally (KNO_3 + high-concentration K-doped $NiCo_2O_4$) and (b) non-hydrothermally (KNO_3 + low-concentration K-doped $NiCo_2O_4$).

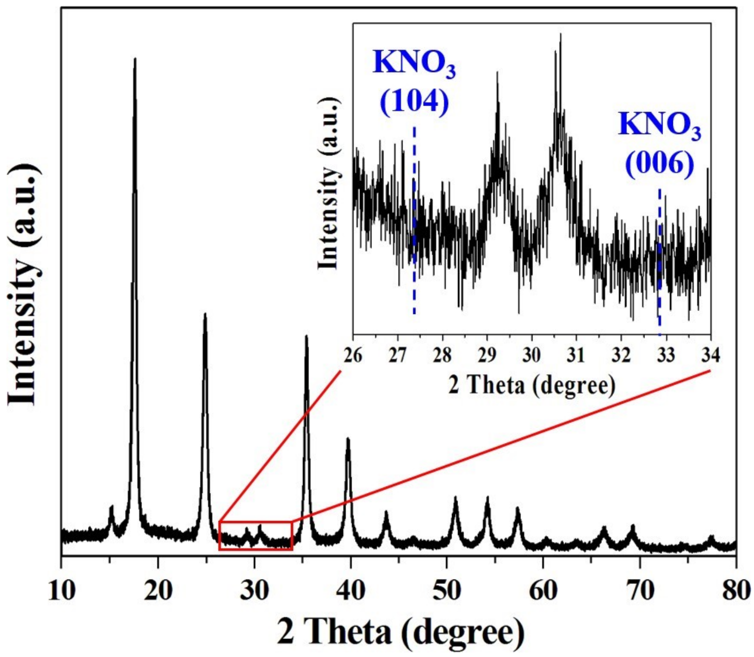
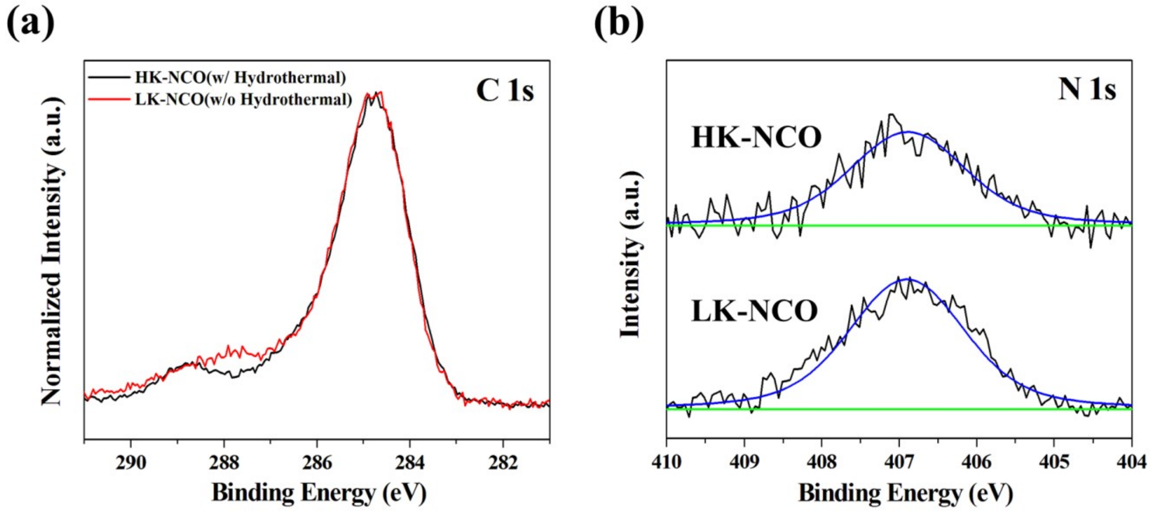


Figure S4. XRD pattern of hydrothermally synthesized K-Ni-Co-PBA. Inset shows an expansion of the region of interest, confirming the absence of crystalline KNO_3.



(c) $$\frac{N_{(area)}}{N_{(ASF)}} = \frac{K_{KNO_3(area)}}{K_{(ASF)}} = \frac{\frac{1}{3}O_{KNO_3(area)}}{O_{(ASF)}}$$

Measured in pure KNO_3

$N_{(ASF)} = 4.506$, $K_{(ASF)} = 1.466$, $O_{(ASF)} = 3.023$

ASF: Atomic Sensitivity Factor

Figure S5. (a) C 1s and (b) N 1s spectra of the synthesized catalysts (calibrated using the C 1s peak of adventitious carbon at 284.4 eV) (c) area calculation of elements derived from KNO_3.

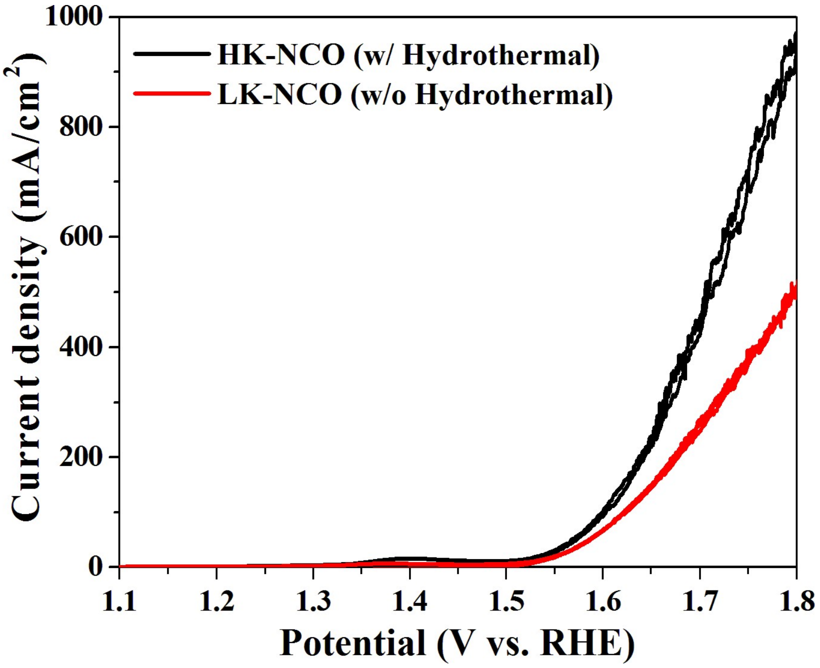


Figure S6. CV curves of the prepared catalysts recorded at a scan rate of 1 mV s^{-1} to extract overpotentials at 10 mA cm^{-2} and Tafel slopes.

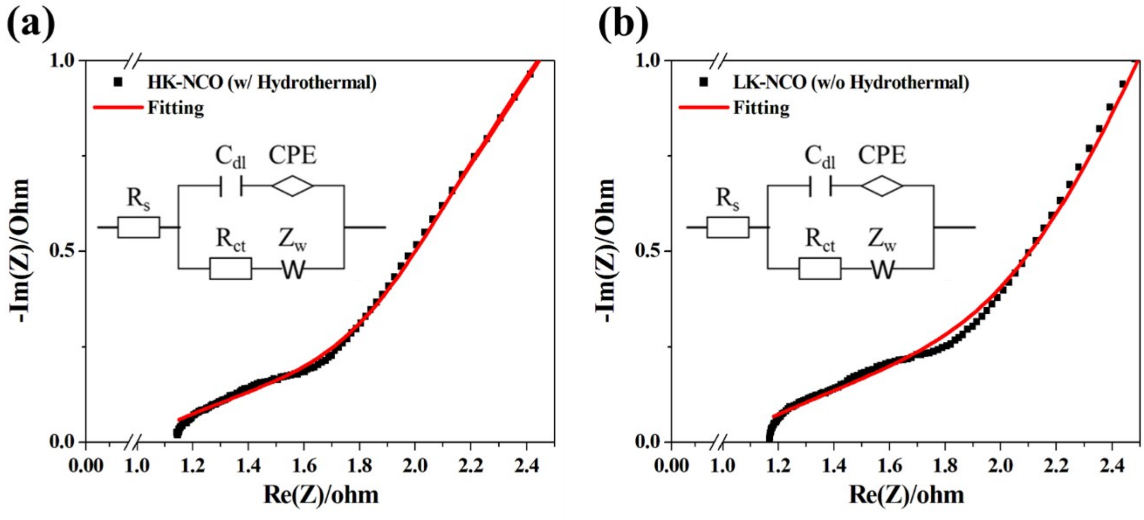


Figure S7. Nyquist plot fitting results for (a) HK-NCO and (b) LK-NCO.

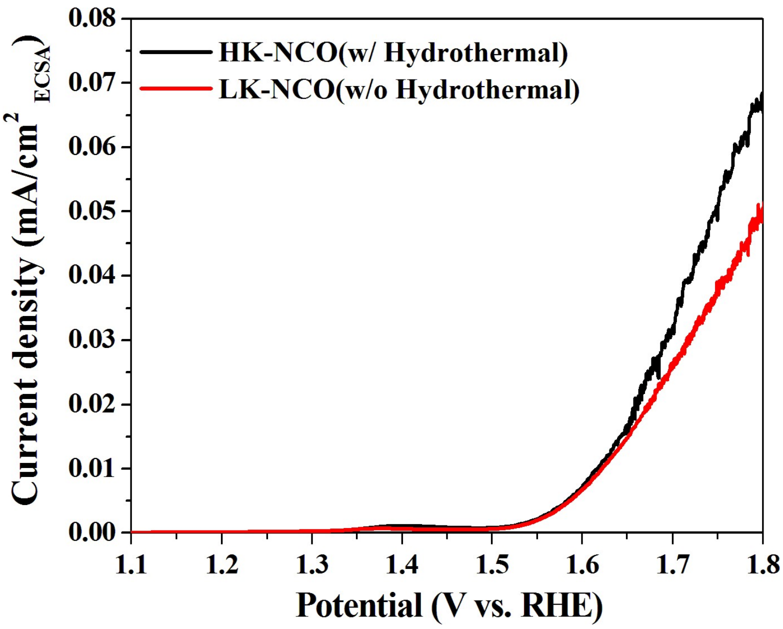


Figure S8. ECSA-normalized LSV polarization curves of the prepared catalysts recorded at a scan rate of 1 mV s^{-1}.

Table S1. Area of peaks corresponding to different chemical states in the X-ray photoelectron spectra of the synthesized catalysts.

Catalyst	□□□+	□□□+	□□□+	□□□+	O1	O2	O3	□□□□ □	□□□□□□ □□	□□□□ □	N
HK-NCO	15003.5	14218.2	11226.4	33370.5	23319.6	18842.2	24618.5	2713.2	2255.2	438.6	1348.1
LK-NCO	37949.5	26733.4	30128.4	79380.8	47448.7	24842.6	9111.2	3976.4	1663.3	642.8	1975.7

Table S2. Comparative overpotentials and Tafel slope values of electrocatalysts in this work and other literature.

Catalyst	Substrate	η (mV) at 10 mA cm^{-2}	Tafel slope (mV dec^{-1})	Electrolyte	Ref
K-doped $NiCo_2O_4$ (HK-NCO)	Ni foam	292 (reverse current)	49.9	1 M KOH	This work
Mesoporous $NiCo_2O_4$	KIT-6 (mesoporous silica molecular sieve)	350	43	1 M KOH	1
P-doped $NiCo_2O_4$ Nanowire	Ni foam	300	120	1 M KOH	2
Ir-doped (10 at%) $NiCo_2O_4$ Nanostructure	Glassy carbon electrode	303	78	1 M KOH	3
MOF-derived $NiCo_2O_4$/NiO-rGO	Glassy carbon electrode	340	66	1 M KOH	4
NiMn LDH nanosheets/$NiCo_2O_4$ nanowires	Ni foam	310	99	1 M KOH	5
$NiCo_2O_4$ 3-D nanoflowers	Graphene nanosheets	383	137	1 M KOH	6
3-D core–shell structured $NiCo_2O_4$@CoS	Ni foam	290	92	1 M KOH	7
Hierarchical $NiCo_2O_4$ nanosheet-CNTs	Ni foam	390	68.1	1 M KOH	8
Co_3O_4/ $NiCo_2O_4$	Ni foam	320	84	0.1 M KOH	9
Hierarchical $NiCo_2S_4$ nanosheets/rGO	Glassy carbon electrode	366	65	1 M KOH	10
$Ni_{0.75}Cu_{0.25}Co_2O_4$	Graphite felt	509	119	1 M KOH	11

MOF (metal organic frameworks), 3-D (Three-dimensional), LDH (layered double hydroxide), CNT (carbon nanotubes), rGO (reduced graphene oxide)

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