Electronic Supplementary Information

Qiangqiang Wang[a], Xuejing Liu[a], Xiang Ren[a], Xu Sun[a], Xuan Kuang[a], Dan Wu[a*], Qin Wei[a, b*]

a School of Chemistry and Chemical Engineering, University of Jinan, Jinan 250022, Shandong, China.

b Department of Chemistry, Sungkyunkwan University, Suwon, 16419, Republic of Korea.

*Corresponding authors: Dan Wu, Qin Wei

E-mail: wudan791108@163.com (D.Wu); sdjndxwq@163.com (Q. Wei)

Meterals: Nickel(II) nitrate hexahydrate ($Ni(NO_3)_2 \cdot 6H_2O$), ferric(III) nitrate nonahydrate ($Fe(NO_3)_3 \cdot 9H_2O$), urea (CH_4N_2O), ammonium fluo-ride (NH_4F), ethanol (C_2H_6O), N, N-Dimethylformamide (DMF), potassium hydroxide (KOH) and sodium hypophosphite ($NaH_2PO_2 \cdot H_2O$) were purchased from Jinan Camolai Trading Company.NF was purchased from Suzhou Taili New Energy Co., Ltd. Pt/C (20 wt% Pt on Vulcan XC-72R) were purchased from Jinan Jiadong Chemical Co., Ltd. The ul- trapure water (UP H_2O) was obtained using the AD3L-05-030OR UP H_2O instrument. All chemicals were analytically pure without further purificatio.

TOF calculation: The TOF is quantified the concentration of active site and calculated by the following equation:

$$TOF = \frac{jA}{4Fm}$$

Where *j* is current density (A cm^{-2}) at defined overpotential; A is the geometric area of the testing electrode; 4 indicates the mole of electrons consumed for evolving one mole O_2 from water; F is the Faradic constant (96485 C mol^{-1}); m is the number of active sites (mol), which can be extracted from the linear relationship between the oxidation peak currents and scan rates by the following equation:

$$slope = \frac{n^2F^2m}{4RT}$$

Where n is the numbers of electron transferred; R and T are the ideal gas constant and the absolute temperature, respectively.

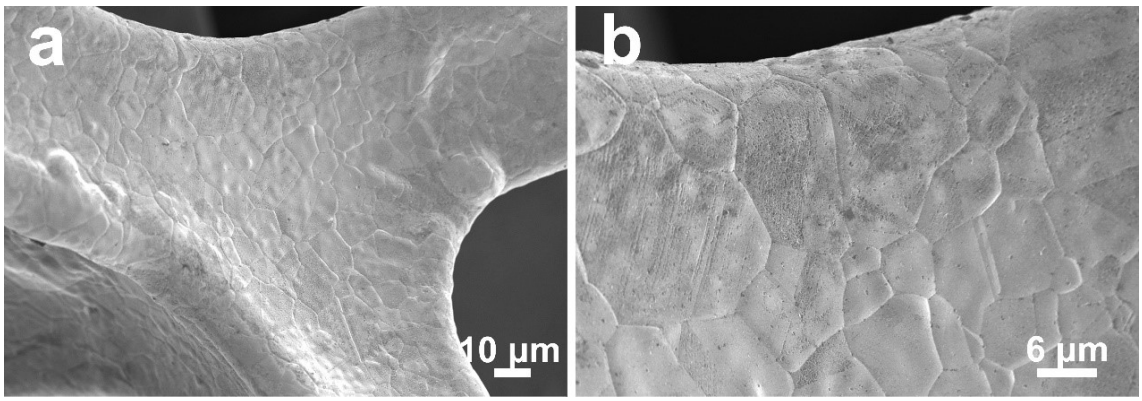

Fig. S1 SEM images of NF at different magnifications.

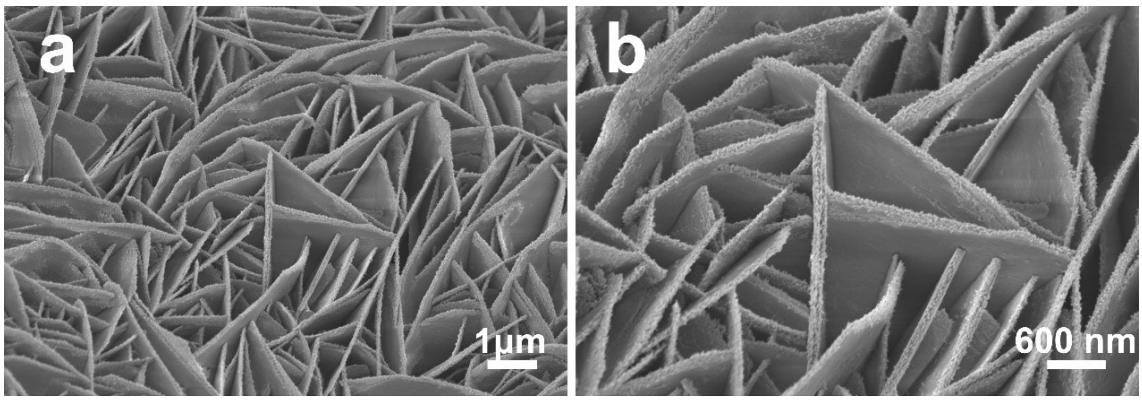

Fig. S2 SEM images of Ni(OH)F/NF at different magnifications.

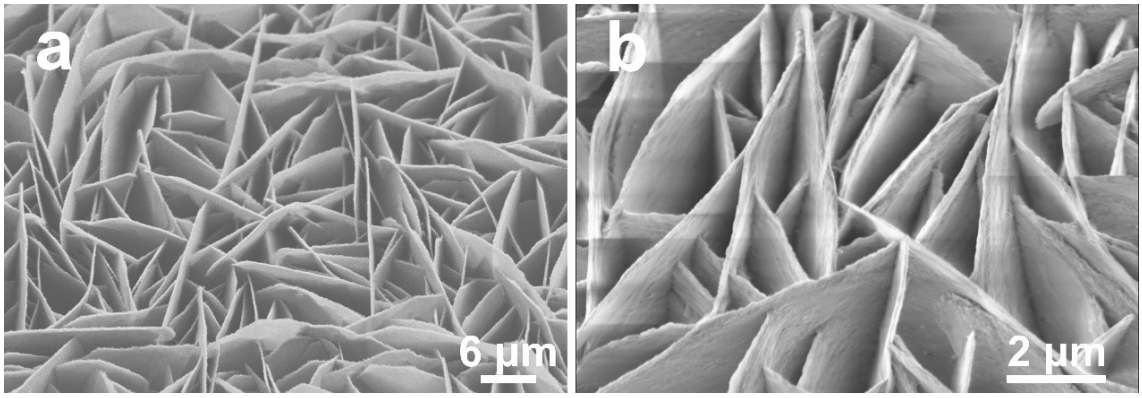

Fig. S3 SEM images of Ni_2P/NF at different magnifications.

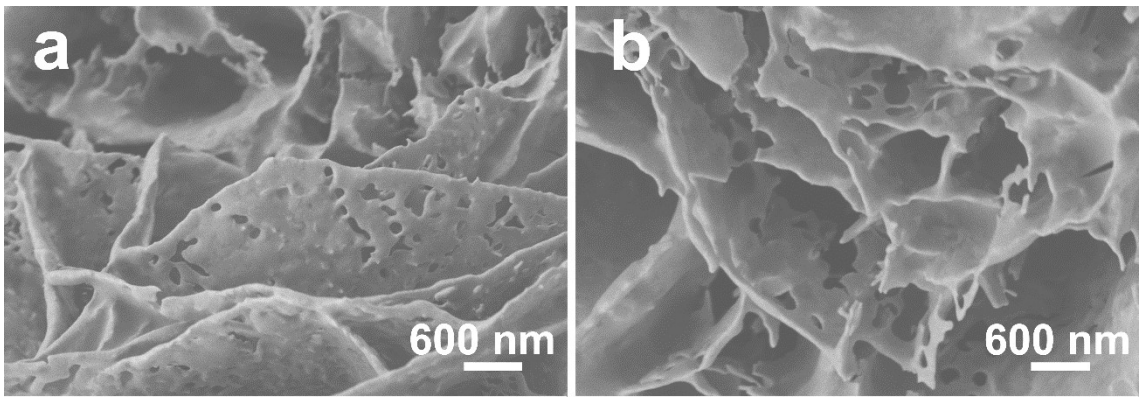

Fig. S4 SEM images of Ni(OH)F/NF treated in different concentrations of ink liquid (a) 0.05 g mL^{-1} (b) 0.20 g mL^{-1}.

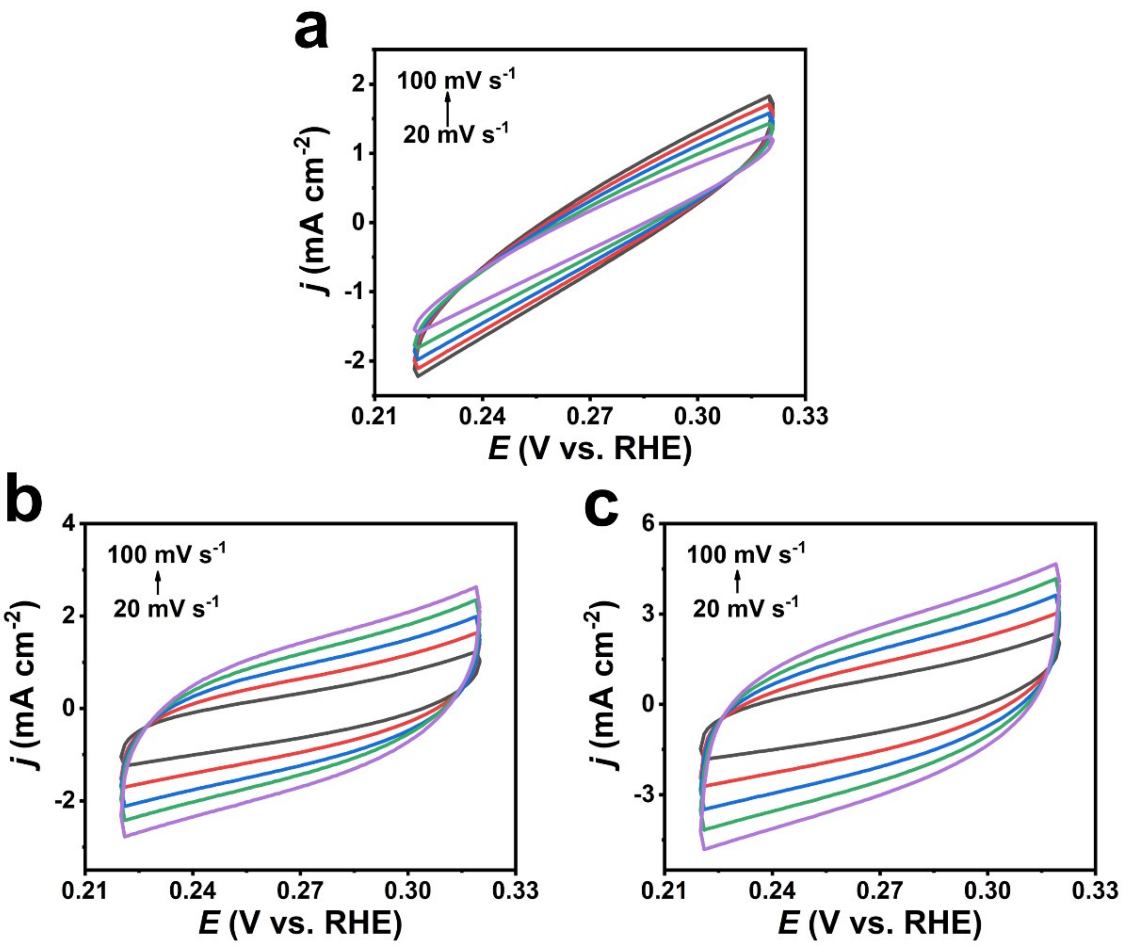

Fig. S5 CV curves of (a) NF, (b) Ni_2P/NF and (c) Ni_2P-FeP_x/NF at different scanning rates.

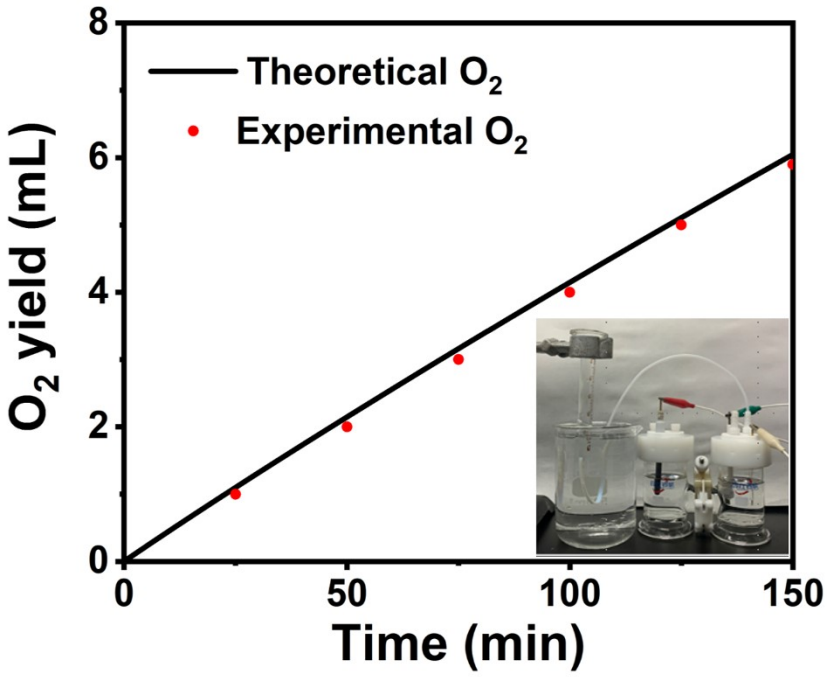

Fig. S6 Volume of oxygen theoretically calculated and actually collected (illustration: gas collection unit).

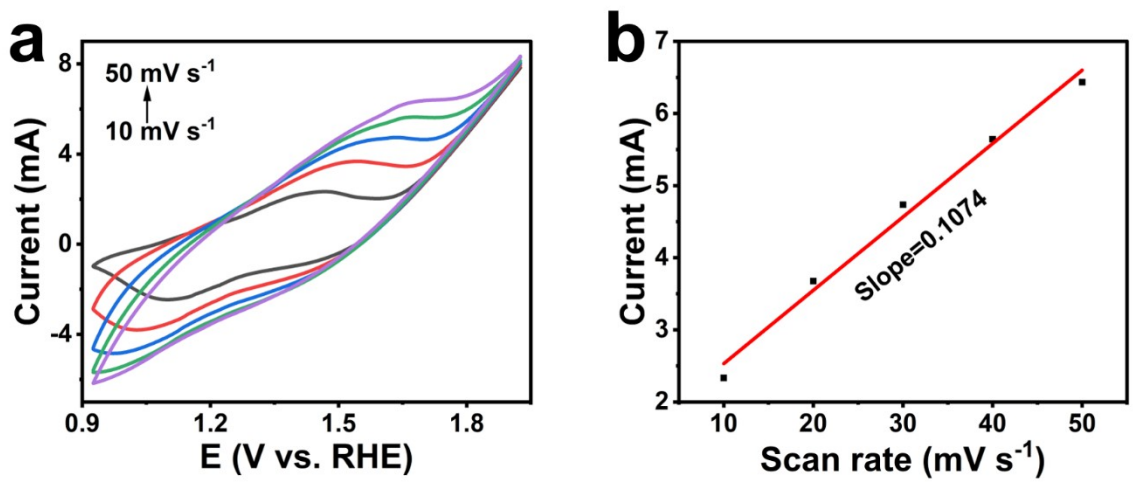

Fig. S7 (a) CVs for Ni_2P-FeP_x/NF under different scan rates from 10 to 50 mV s^{-1} in 1.0 M KOH. (b) Linear relationship of the peak currents *vs*. scan rates.

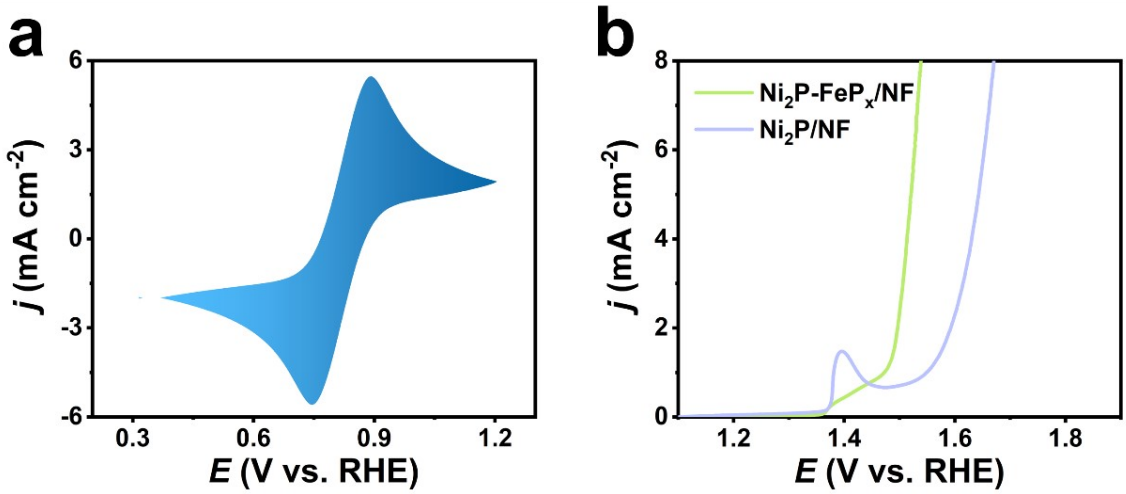

Fig. S8 (a) CV curve recorded by NF in potassium ferriccyanide (5 mM) at a scanning rate of 50 mV s^{-1}; (b) Electrochemical surface area normalization OER polarization curves.

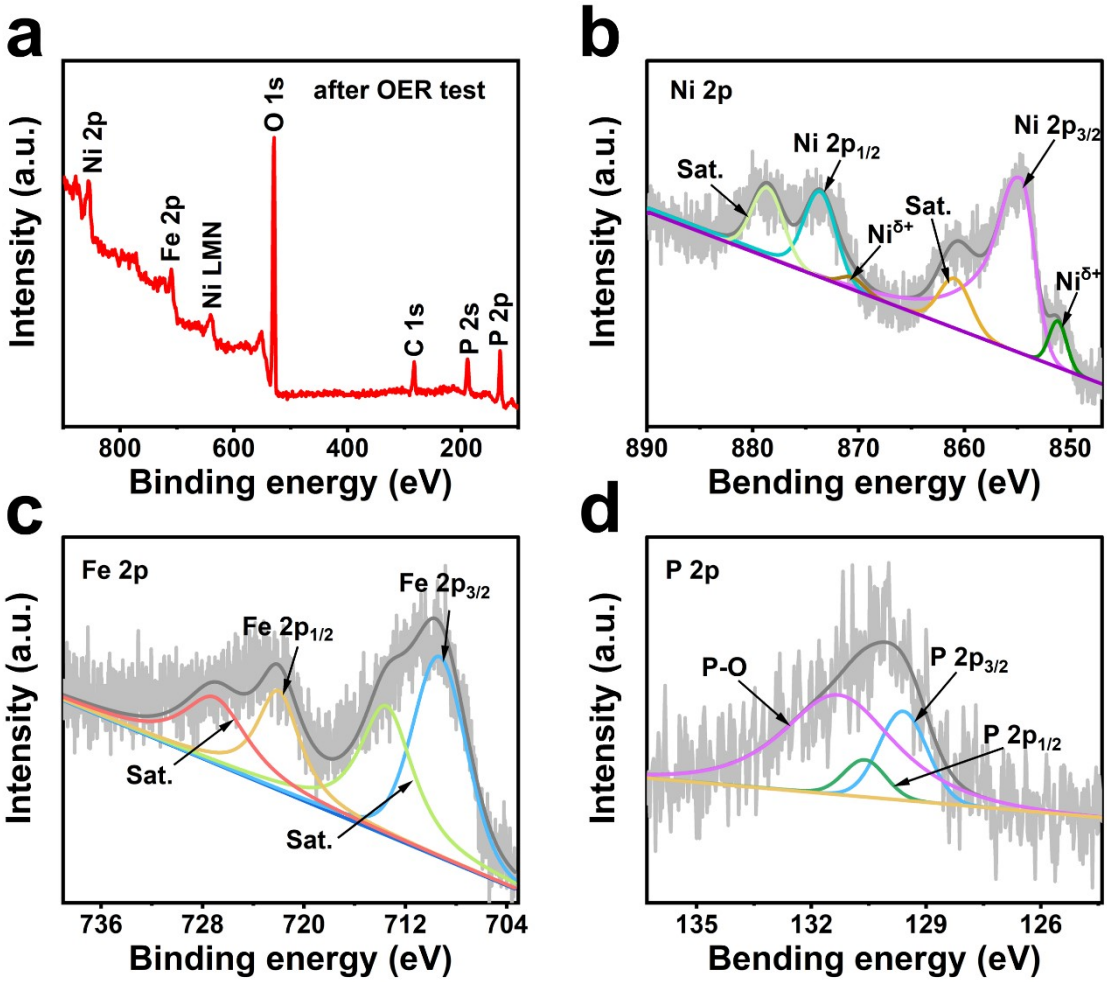

Fig. S9 (a) XPS survey spectrum of Ni_2P-FeP_x/NF after OER test; High-resolution XPS spectra of (b) Ni 2p, (c) Fe 2p and (d) P 2p in Ni_2P-FeP_x/NF after OER test.

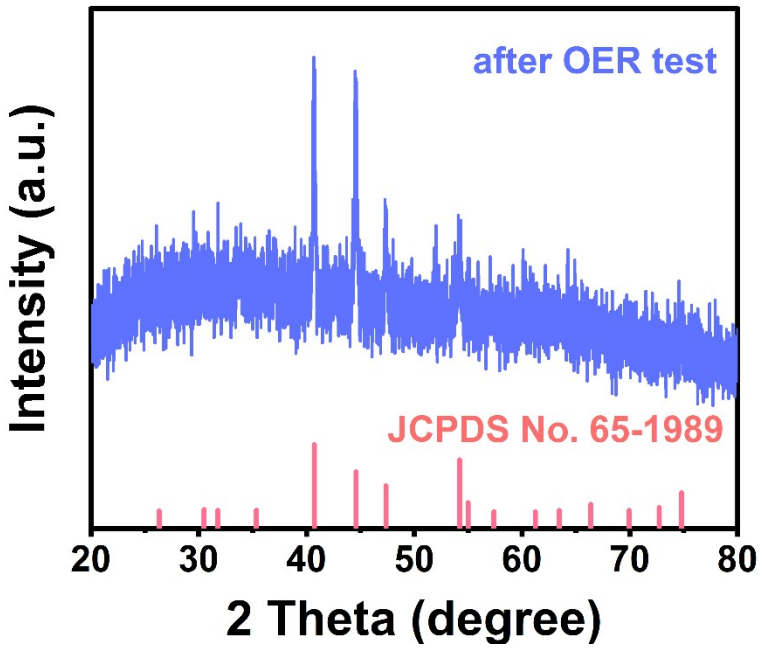

Fig. S10 XRD image of Ni_2P-FeP_x after OER test.

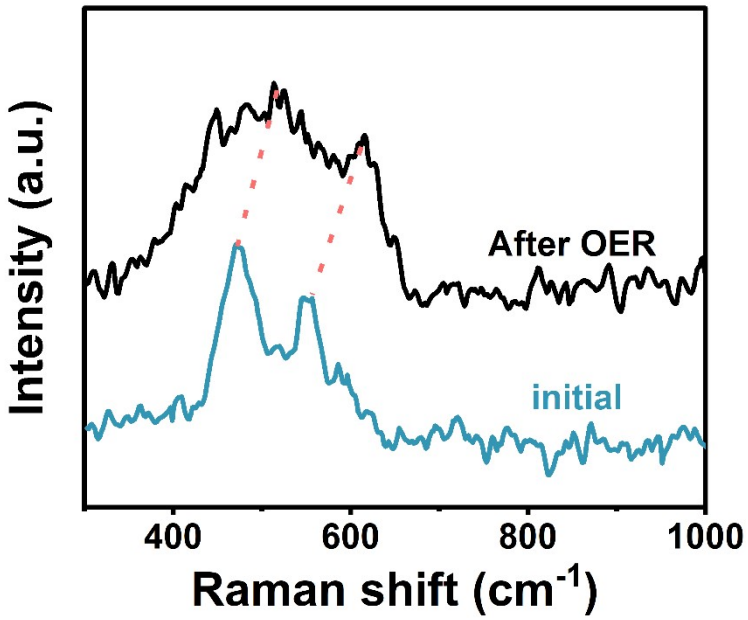

Fig. S11 Raman spectra for Ni_2P-FeP_x prior to and after OER test.

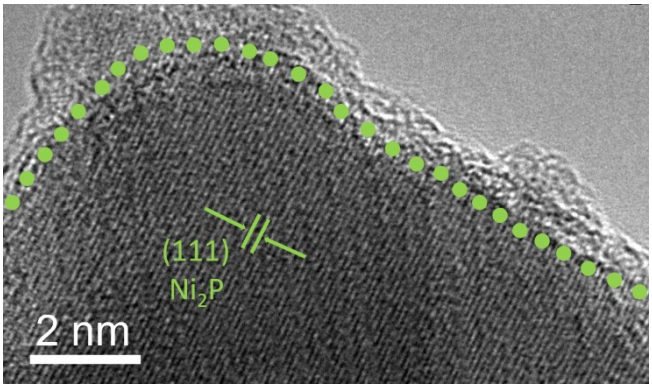

Fig. S12 HRTEM image of Ni_2P-FeP_x after OER test.

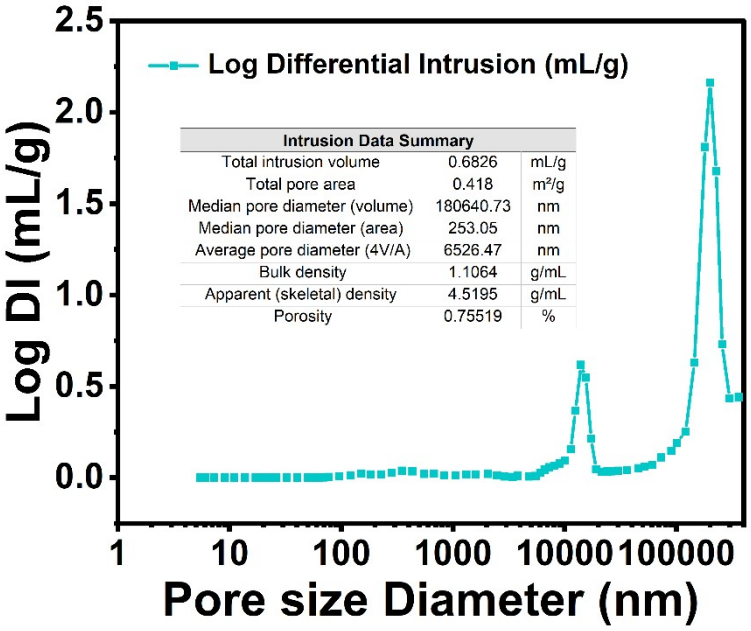

Fig. S13 Mercury injection curve of Ni_2P-FeP_x/NF.

Table S1 Comparison of OER performance of Ni_2P-FeP_x/NF and other catalysts in 1.0 M KOH

Catalyst	Electrolyte	j (mA cm^{-2})	TOF(s^{-1})	η (mV)	Ref.
Ni_2P-FeP_x	**1.0 M KOH**	**50**	**0.458**	**241**	**This work**
V-Ni_2P	1.0 M KOH	10	1.85	250	[1]
$FeNi_2P$	1.0 M KOH	10	/	210	[2]
Ni_2P	1.0 M KOH	10	/	290	[3]
$Ni_{1-x}Fe_xPS$	1.0 M KOH	100	0.097	300	[4]
Ni_2P-Fe_2P	1.0 M KOH	100	0.925	315	[5]
$NiPS_3$	1.0 M KOH	10	0.0294	343	[6]

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