Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information for

Room-temperature synthetic NiFe layered double hydroxide with different anions intercalation as excellent oxygen evolution catalyst

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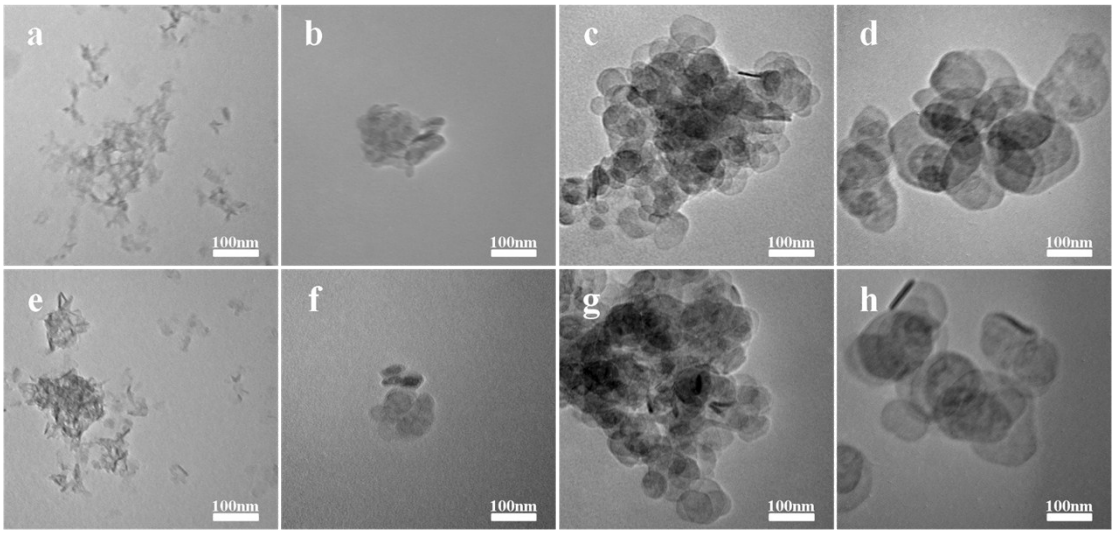

Fig S1. TEM images of NiFe-LDH under different resultant temperature for 12 h with a 24:2 (a-d) and 24:4 (e-h) ratio of NaOH and Na_2CO_3. (a, e) RT. (b, f) 90 ºC. (c, g) 120 ºC. (d, h) 150 ºC.

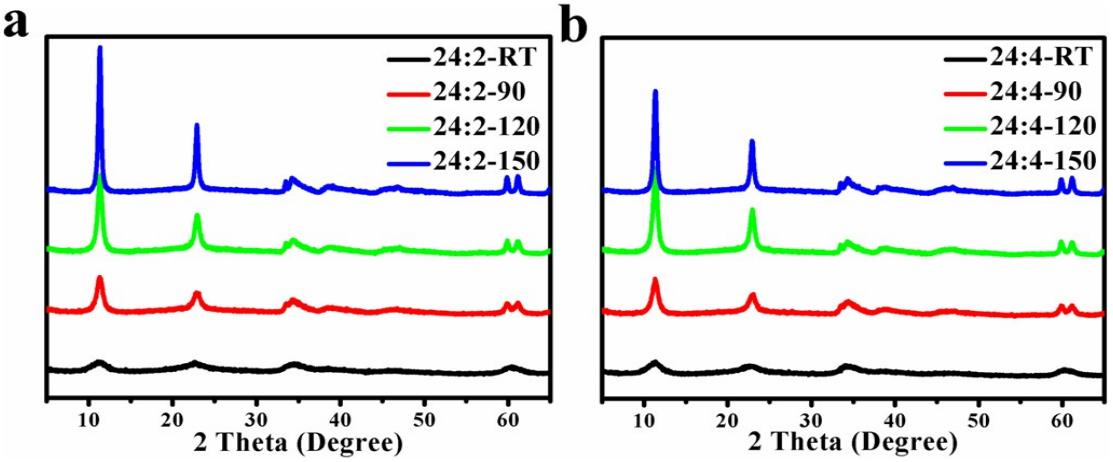

Fig S2. The XRD spectra of NiFe-LDH aged under different resultant temperature with a 24:2 (a) and 24:4 (b) ratio of NaOH and Na_2CO_3. (c)The partial enlarged view of XRD spectra of NiFe-LDH with a 24:0 ratio of NaOH and Na_2CO_3.

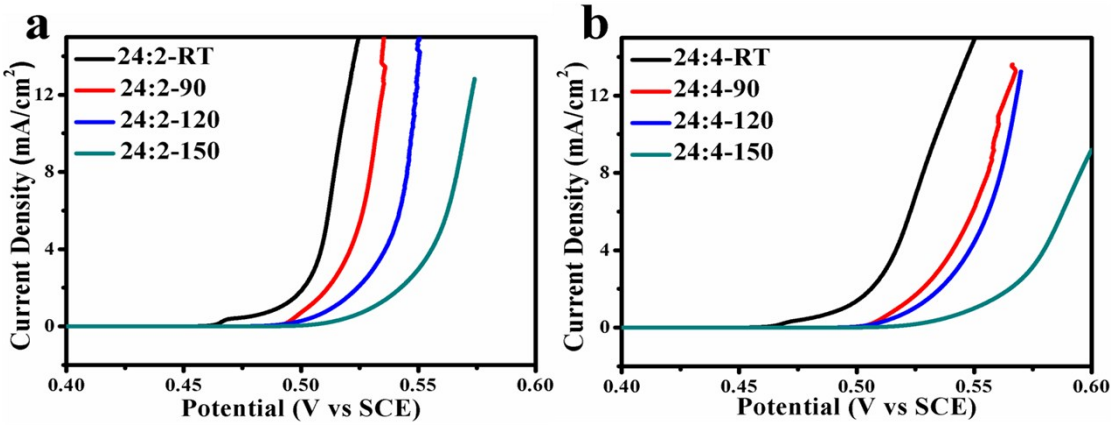

Fig S3. The electrochemical performance of NiFe-LDH with (a) 24:2 and (b) 24:4 ratio of NaOH and Na_2CO_3 respectively.

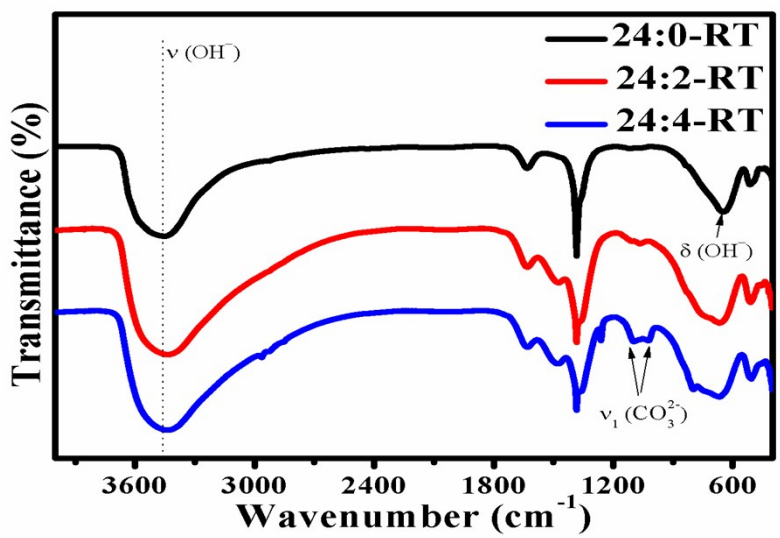

Fig S4. The FT-IR spectrum of NiFe-LDH OER catalyst with various ratios of NaOH and Na_2CO_3 at RT from 4000 to 400 cm^{-1}. The labled ν (OH^-), δ(OH^-) and ν_1 (CO_3^{2-}) are accoding to *J. Mater. Sci., 2003, 38(9): 2087-2093; J. Raman Spectrosc. 2008, 39: 582–586 and J. Bone. Miner. Res., 2001, 16(5): 893-900.*

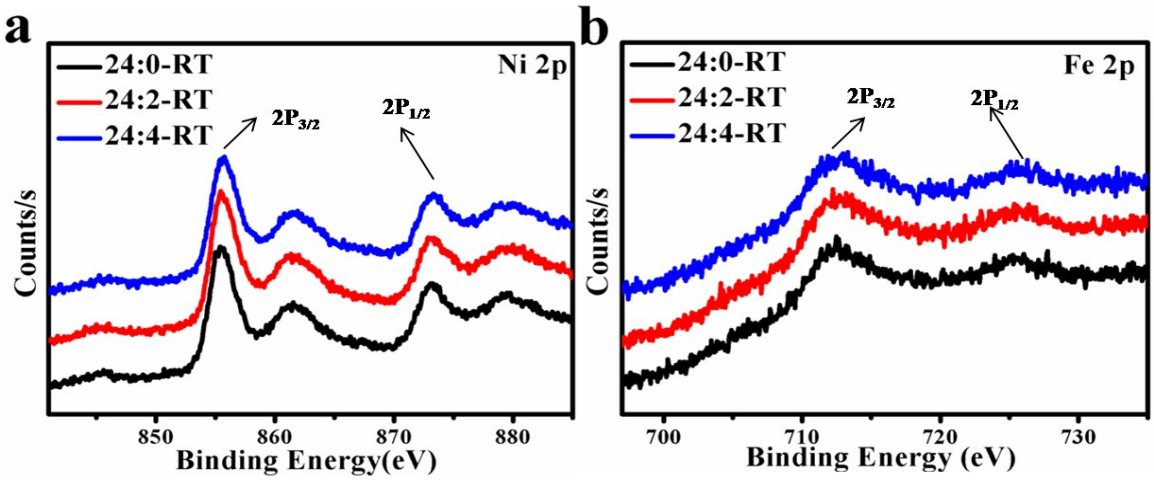

Fig S5. The high-resolution (a) Ni 2p XPS survey spectra and (b) Fe 2p XPS survey spectra.

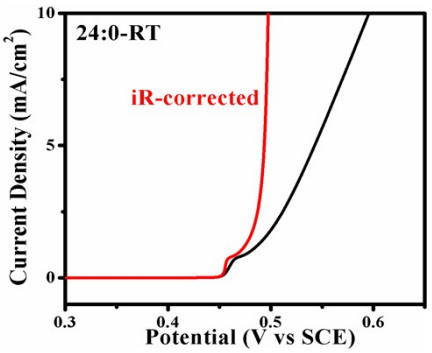

Fig S6. LSV curve for modified GC electrodes comprising the 24:0-RT NiFe-LDH with (red) and without (black) correction for iR loss.

Table S1

OER activities of some benchmark catalysts in alkaline solution at 10 mA/cm^2.

Material	Solution (KOH (mol/L))	Potential vs RHE (V)	Tafel Slope (mV/dec)	Reference
24:0-RT NiFe-LDH	**0.1 M**	**1.50**	**33.6**	**This work**
NiFe-LDH/CNT	0.1 M	1.538	35	13
CQD/NiFe-LDH	0.1 M	/	35	18
$Mn_3O_4/CoSe_2$	0.1 M	1.68	49	S1
NG-$CoSe_2$	0.1 M	1.596	40	S2
RuO_2	0.1 M	1.596	40	
g-C_3N_4 NS–CNT	0.1 M	1.60	83	S3
IrO_2–CNT	0.1 M	1.59	90	
3D Ni@[$Ni^{(2+/3+)}$ Co_2 $(OH)_{6-7}]_x$ nanotube arrays	0.1 M	1.69	65	S4
Ultrathin $CoSe_2$ nanosheet	0.1 M	1.55	44	S5
$Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}$	0.1 M	~1.592	~48	1; 16
NiCo-LDH array	0.1 M	1.65	113	14
$Ni_{0.9}Fe_{0.1}Ox$	1 M	1.566	30	4
NiFe LDH nanosheets	1 M	1.532	40	16
$[Ni_{1-x}Fex(OH)_2](NO_3)y$ (OH)x-y•nH_2O with Ni_3TiO_5 and $La(Ni,Fe)O_3$	1 M	1.49	44.7	17

References

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[S5] Y. Liu, H. Cheng, M. Lyu, S. Fan, Q. Liu, W. Zhang, Y. Zhi, C. Wang, C. Xiao, S. Wei, B. Ye, Y. Xie, J. Am. Chem. Soc. 136 (2014) 15670–15675.