

Supporting Information:

**Bimetallic NiFe MOF with ultra-thin two-dimensional
nanosheet structure effectively accelerates oxygen evolution
reaction**

Jiaqi He, Xin Deng, Wenting Sun, Wenjing Shang, Yongbing Lou, Jinxi Chen*

School of Chemistry and Chemical Engineering, Jiangsu Engineering Laboratory of
Smart Carbon-Rich Materials and Device, Southeast University, Nanjing 211189, PR
China

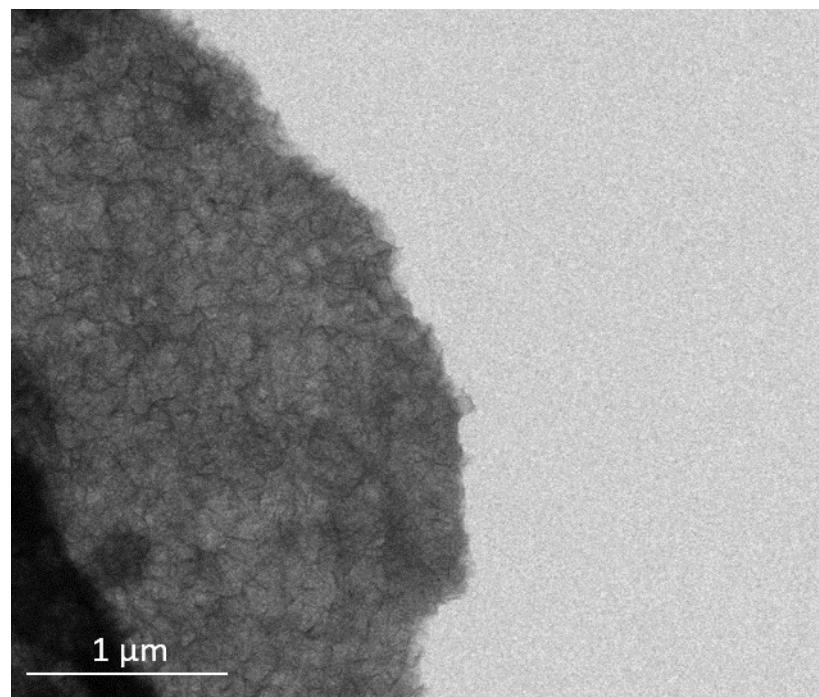


Figure S1. TEM image of NiFe-NDC.

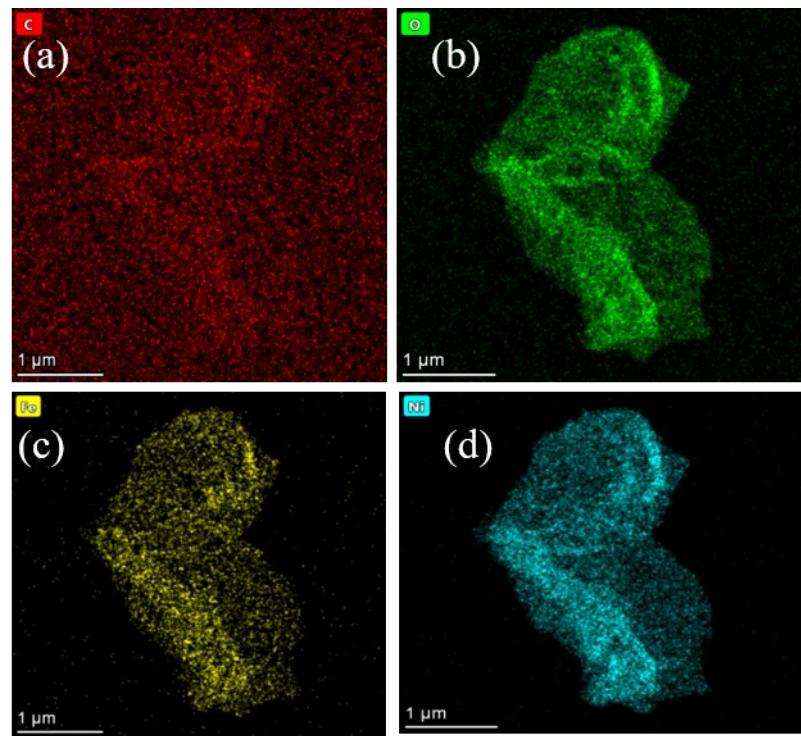


Figure S2. Elemental mapping images of NiFe-NDC.

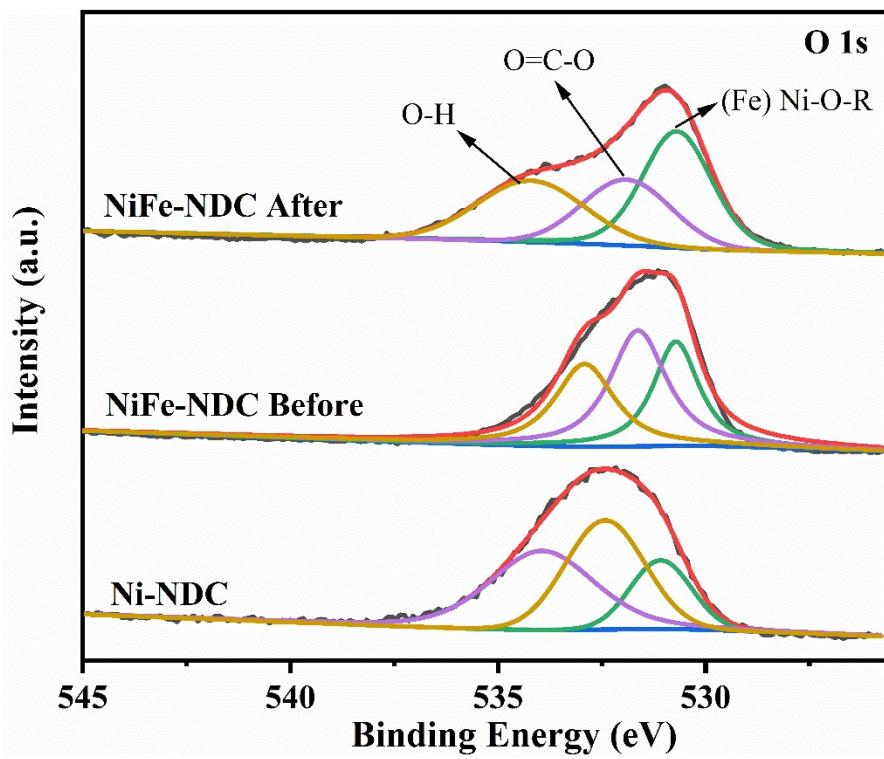


Figure S3. High-resolution XPS spectrums of O 1s for Ni-NDC, NiFe-NDC before and after OER reaction.

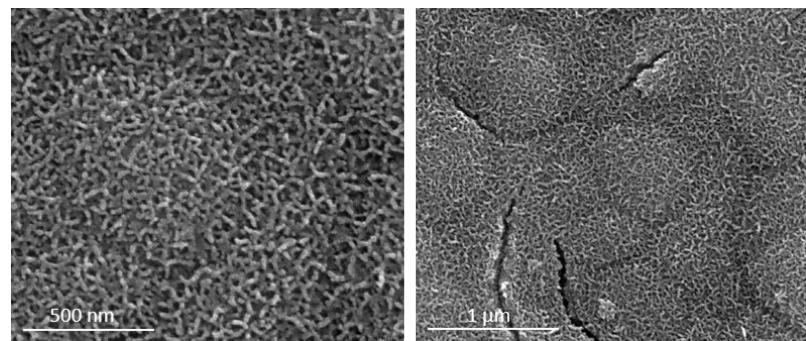


Figure S4. SEM images of NiFe-NDC after 20 h stability test.

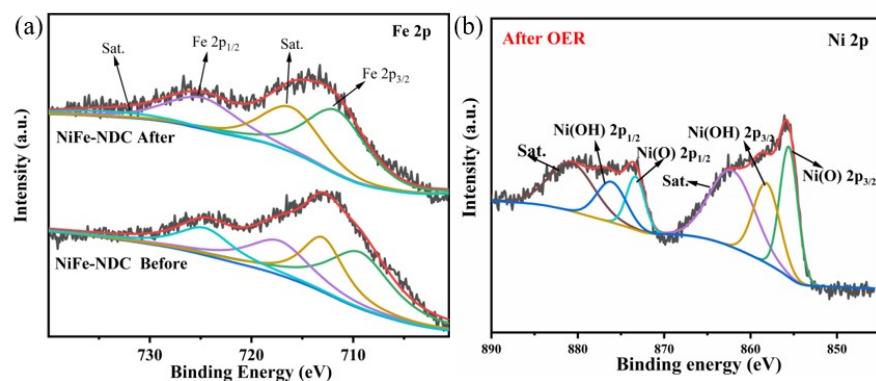


Figure S5. XPS spectra of (a)Fe 2p and (b) Ni 2p of NiFe-NDC after OER.

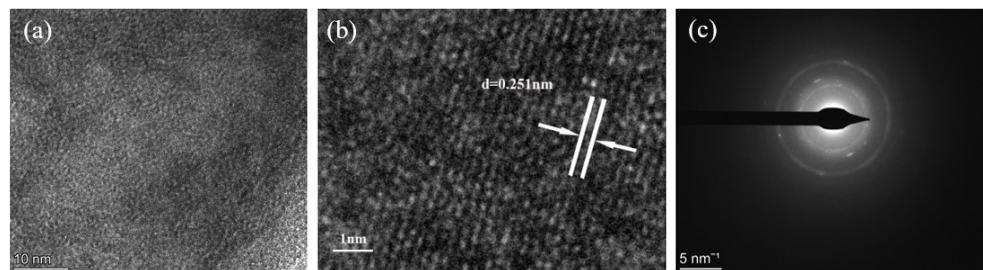


Figure S6. (a) and (b) HRTEM images of NiFe-NDC after OER. (c) SAED pattern.

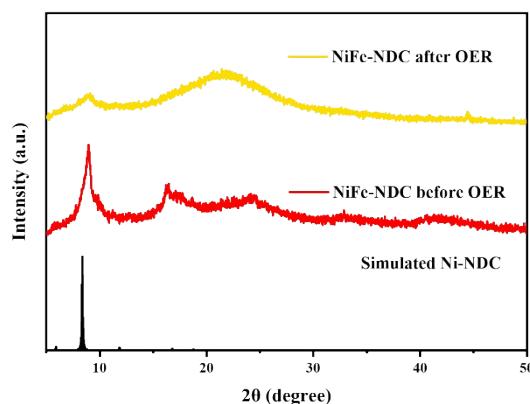


Figure S7. XRD pattern of NiFe-NDC before and after OER.

Table S1. Comparison of OER catalytic performance of various MOFs

Catalyst	Current Density	Overpotencial	Reference
NiFe-NDC	10	206	This work
Ru/NiFe(OH) _x /NiFe-MOF	10	242	1
NiFe-2D MOF NSs	10	260	2
NiFe-UMNs	10	260	3
MOF-(74 + 274)@NFF	10	198	4
NiFe(dobpdc)	10	207	5
FJI-H25FeCo	10	231	6
Fe-Co-Ni MOF	10	254	7
NiFe LDH/MOF	10	196	8
Ni(Fe)-MOF	10	227	9
Ru@FeNi LDH/MOF	10	242	10
MOF-Fe/Co(1:2)	10	238	11
CoFe-LDH/Co-MOF	10	215	12
NiCo/Fe ₃ O ₄ /MOF-74	10	238	13
Ni-BDC/NM88B(Fe)	10	179	14
Fe-NiS ₂ @NC	10	255	15
NiFe-MOF	10	240	16
NFF-MOF	10	250	17
Pt@NiFe-LDH	10	239	18
S/N-CMF@Fe _x Co _y Ni _{1-x-y} -MOF	10	296	19
Fe-Ni-CoOOH-TPA	10	236	20

Table S2. Fe and Ni atomic percentages in ICP-MS.

Samples	Fe / wt%	Ni / wt%
NiFe-NDC	9.88	5.08

Reference

1. D. M. Liu, H. Xu, C. Wang, C. Q. Ye, R. Yu and Y. K. Du, *Journal of Materials Chemistry A*, 2021, 9, 24670-24676.
2. Y. Liu, X. Li, Q. Sun, Z. Wang, W.-H. Huang, X. Guo, Z. Fan, R. Ye, Y. Zhu, C.-C. Chueh, C.-L. Chen and Z. Zhu, *Small*, 2022, 18, 2201076.
3. G. Hai, X. Jia, K. Zhang, X. Liu, Z. Wu and G. Wang, *Nano Energy*, 2018, 44, 345-352.
4. Y. Jiang, T.-Y. Chen, J.-L. Chen, Y. Liu, X. Yuan, J. Yan, Q. Sun, Z. Xu, D. Zhang, X. Wang, C. Meng, X. Guo, L. Ren, L. Liu and R. Y.-Y. Lin, *Advanced Materials*, 2024, 36, 2306910.
5. L. Qi, Y.-Q. Su, Z. Xu, G. Zhang, K. Liu, M. Liu, E. J. M. Hensen and R. Y.-Y. Lin, *Journal of Materials Chemistry A*, 2020, 8, 22974-22982.
6. J. Tian, F. Jiang, D. Yuan, L. Zhang, Q. Chen and M. Hong, *Angewandte Chemie-International Edition*, 2020, 59, 13101-13108.
7. F. S. Farahani, M. S. Rahmanifar, A. Noori, M. F. El-Kady, N. Hassani, M. Neek-Amal, R. B. Kaner and M. F. Mousavi, *Journal of the American Chemical Society*, 2022, 144, 3411-3428.
8. H. Yin, S. Su, D. Yao, L. Wang, X. Liu, T. T. Isimjan, X. Yang and D. Cai, *Inorganic Chemistry Frontiers*, 2024, 11, 2489-2497.
9. C. Cao, D.-D. Ma, Q. Xu, X.-T. Wu and Q.-L. Zhu, *Advanced Functional Materials*, 2019, 29, 1807418.
10. Y. Cao, Y. Wen, Y. Li, M. Cao, B. Li, Q. Shen and W. Gu, *Dalton Transactions*, 2024, 53, 5291-5300.
11. K. Ge, S. Sun, Y. Zhao, K. Yang, S. Wang, Z. Zhang, J. Cao, Y. Yang, Y. Zhang, M. Pan and L. Zhu, *Angewandte Chemie-International Edition*, 2021, 60, 12097-12102.
12. G. Yang, Y. Song, S. Han, Z.-Z. Xue, D.-X. Liu, A. Wang and G. Wang, *Inorganic Chemistry*, 2024, 63, 5634-5641.
13. X. Wang, H. Xiao, A. Li, Z. Li, S. Liu, Q. Zhang, Y. Gong, L. Zheng, Y. Zhu, C. Chen, D. Wang, Q. Peng, L. Gu, X. Han, J. Li and Y. Li, *Journal of the American Chemical Society*, 2018, 140, 15336-15341.
14. Y. Bao, H. Ru, Y. Wang, K. Zhang, R. Yu, Q. Wu, A. Yu, D.-S. Li, C. Sun, W. Li and J. Tu, *Advanced Functional Materials*, 2024, DOI: 10.1002/adfm.202314611.
15. F. Wen, L. Pang, T. Zhang, X. Huang, C. Li and H. Liu, *International Journal of Hydrogen Energy*, 2024, 57, 263-272.
16. J. Duan, S. Chen and C. Zhao, *Nature Communications*, 2017, 8.
17. W. Chen, X. Zhu, Y. Zhang, Y. Zhou and K. K. Ostrikov, *Acs Sustainable Chemistry & Engineering*, 2021, 9, 1826-1836.
18. J.-M. Huo, Z.-L. Ma, Y. Wang, Y.-J. Cao, Y.-C. Jiang, S.-N. Li, Y. Chen, M.-C. Hu and Q.-G. Zhai, *Small*, 2023, 19.
19. Y. Zhao, X. F. Lu, Z.-P. Wu, Z. Pei, D. Luan and X. W. Lou, *Advanced Materials*, 2023, 35, 2207888.

20. H. Chu, R. Li, P. Feng, D. Wang, C. Li, Y. Yu and M. Yang, *Acs Catalysis*, 2024, 14, 1553-1566.