Electronic Supplementary Material (ESI) for New Journal of Chemistry.


# Supporting Information

# Preparation of metal phosphide derived from dual-ligand NiFe-MOF and its boosting activity toward electrolysis of water

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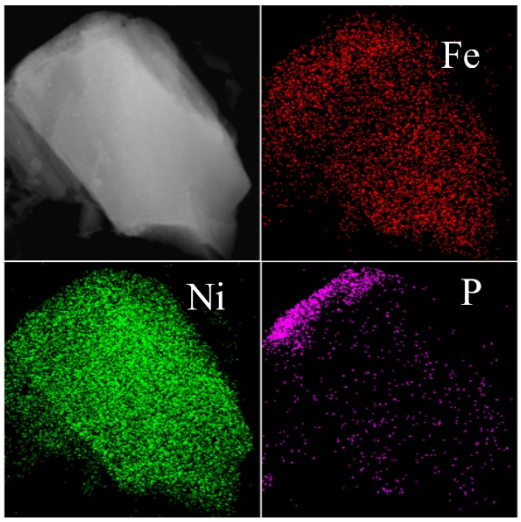


Fig. S1 elemental mapping image of P-FeNi

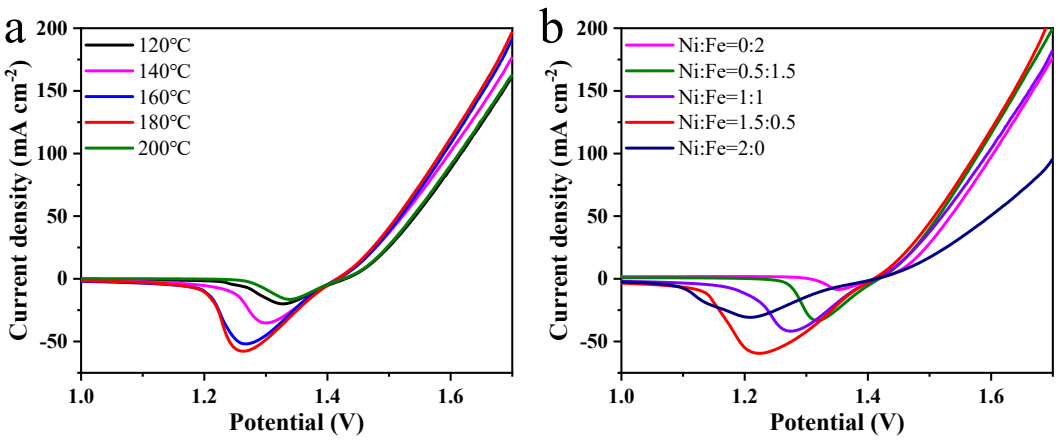


Fig. S2 LSV curves of different hydrothermal temperature (a) and different nickel-iron ratio (b) of P-FeNi@NFF.

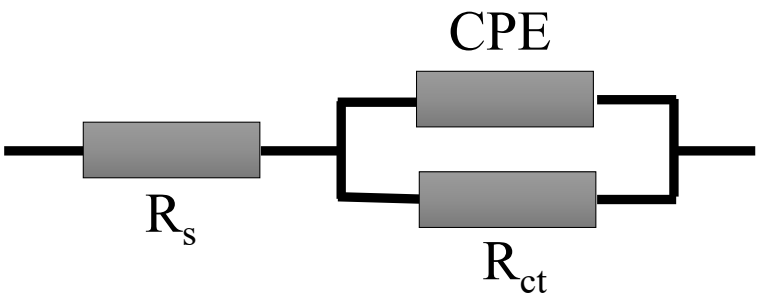


Fig. S3 The equivalent circuit model of EIS Nyquist diagram is fitted. $R_s$: solution resistance; $R_{ct}$: charge transfer resistance; CPE: Other resistors.

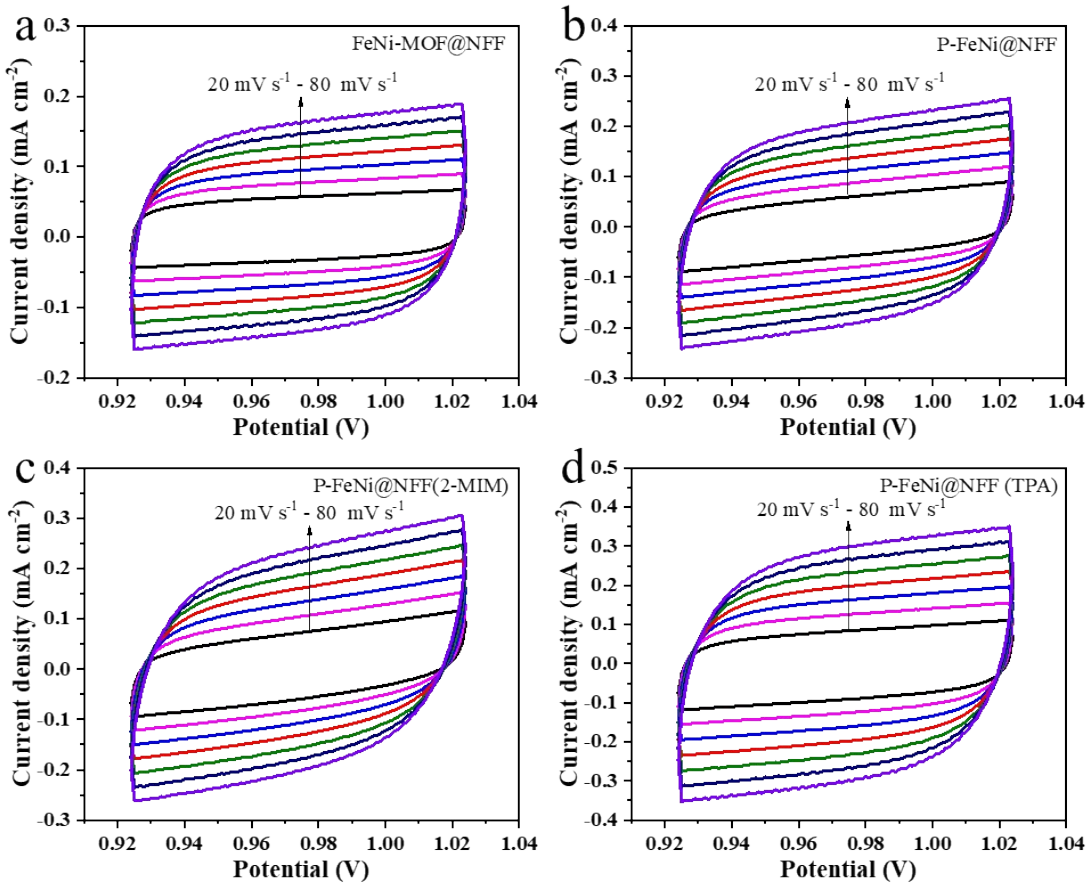


Fig. S4 CV diagrams of FeNi-MOF@NFF (a), P-FeNi@NFF (b), P-FeNi@NFF(2-MIM) (c), and P-FeNi@NFF(TPA) (d) at different sweep rates of 20-80 mV $s^{-1}$.

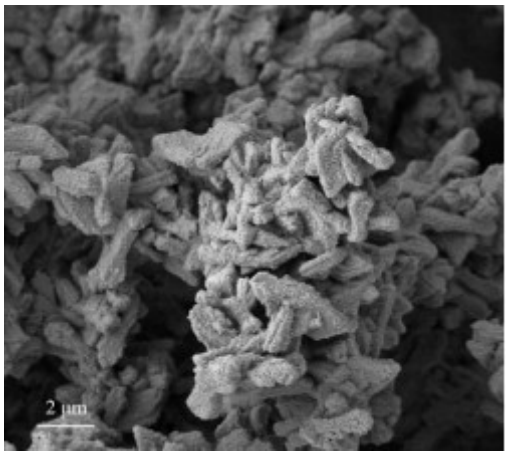


Fig. S5 SEM of P-FeNi@NFF after stability test

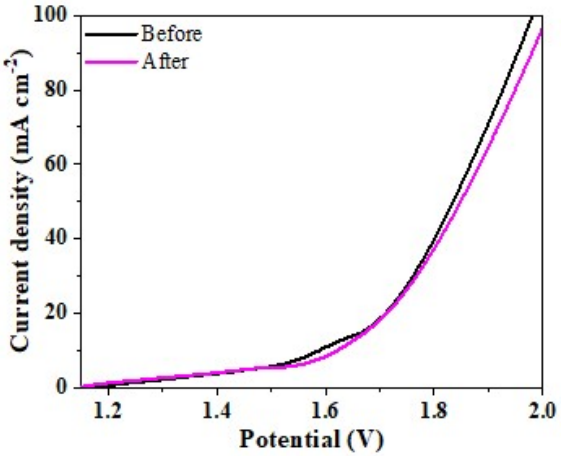


Fig. S6 LSV comparison of P-FeNi@NFF before and after stability test

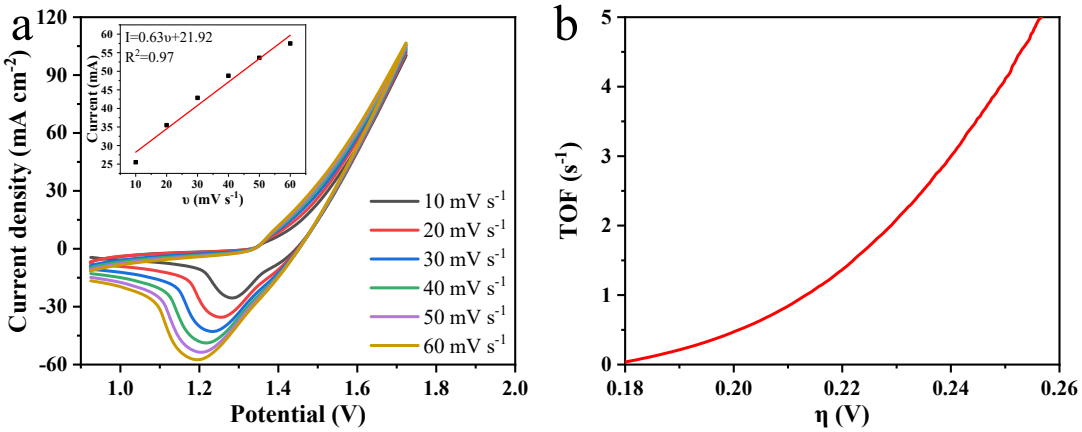


Fig. S7 CV curves of P-FeNi@NFF as the scanning rate increases from 10 mV $s^{-1}$ to 80 mV $s^{-1}$ (Inset: linear relationship between peak oxidation current and scanning rate). (d) The relationship between TOF of P-FeNi@NFF and overpotential.

# Tables

Table S1 Performance comparison of materials for OER

| Catalysts | Overpotential/mV | | Z/Ω | |
|---|---|---|---|---|
| | at 10 mA $cm^{-2}$ | at 100 mA $cm^{-2}$ | $R_s$ | $R_{ct}$ |
| FeNi-MOF@NFF | 202 | 282 | 3.75 | 6.91 |
| P-FeNi@NFF | 194 | 241 | 2.07 | 0.62 |
| P-FeNi@NFF(2-MIM) | 232 | 287 | 2.04 | 1.19 |
| P-FeNi@NFF(TPA) | 201 | 251 | 2.25 | 0.64 |

Table S2 Performance comparison of self-supported catalysts for OWS

| Electrolytic cell | Cell voltage/at 10 mA $cm^{-2}$ | Ref. |
|---|---|---|
| P-FeNi@NFF \|\| P-FeNi@NFF | 1.59 V | This work |
| Fe-MOF/Au-8/FF \|\| Fe-MOF/Au-8/FF | 1.61 V | [1] |
| NiSP/NF \|\| NiSP/NF | 1.70 V | [2] |
| NiCoP/NF \|\| NiCoP/NF | 1.60 V | [3] |
| NiFe-MOF-74/NF \|\| NiFe-MOF-74/NF | 1.58 V | [4] |
| Fe,Rh-Ni2P/NF \|\| Fe,Rh-Ni2P/NF | 1.62 V | [5] |
| DLC FCP@NG \|\| DLC FCP@NG | 1.63 V | [6] |
| CoNi2S4/Ni3S2@NF \|\| CoNi2S4/Ni3S2@NF | 1.65 V | [7] |

# References


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