A novel cobalt-iron-vanadium layered double hydroxide nanosheets arrays toward the superior water oxidation performance

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Figure S1. The schematic image of the synthesis procedure.



Figure S2. XRD pattern of CoV LDH/NF.



Figure S3. XPS survey spectrum of the CoFeV-0.25/NF.



Figure S4. XPS spectrum of O 1s for CoFeV-0.25/NF.



Figure S5. LSV polarization curves (a) and the corresponding Tafel plots (b) of CoFeV-0.25/NF, CoV LDH/NF, RuO₂/NF and bare NF.



Figure S6. (a-c) The CV curves of CoFeV-0.125/NF, CoFeV-0.5/NF and CoFe LDH/NF at different scan rates from 3 to 11 mV/s.



Figure S7. The electrochemical double-layer capacitances of CoFe LDH/NF.



Figure S8. XRD patterns of CoFeV-0.5/NF and CoFeV-0.125/NF.



Figure S9. LSV polarization curves of HER performance of Pt-C/NF.

| Sample | R_s/Ω | R_{ct}/Ω |
|----------------|--------------|-----------------|
| CoFe LDH/NF | 0.858 | 40.810 |
| CoFeV-0.125/NF | 1.242 | 3.112 |
| CoFeV-0.25/NF | 1.123 | 0.928 |
| CoFeV-0.5/NF | 1.317 | 2.019 |
| | | |

Table S1. Impedance fitting results of CoFeV LDH/NF with the diverse introduction of V.

Table S2. Summary of ICP results of CoFeV LDH/NF with diverse the introduction of V.

| Sample | Added value of | The calculated of |
|----------------|----------------|-------------------|
| | Co: Fe: V | Co: Fe: V |
| | (molar ratio) | (atomic ratio) |
| CoFeV-0.125/NF | 1: 1: 0.125 | 1.50: 1: 0.06 |
| CoFeV-0.25/NF | 1: 1: 0.25 | 1.54: 1: 2.56 |
| CoFeV-0.5/NF | 1: 1: 0.5 | 2.01: 1: 7.27 |