Supplementary Information

Highly Active NiFe LDH anchoring on Cobalt Carbonate Hydroxide for Efficient Electrocatalytic 5-hydroxymethylfurfural oxidation towards 2,5-furandicarboxylic acid

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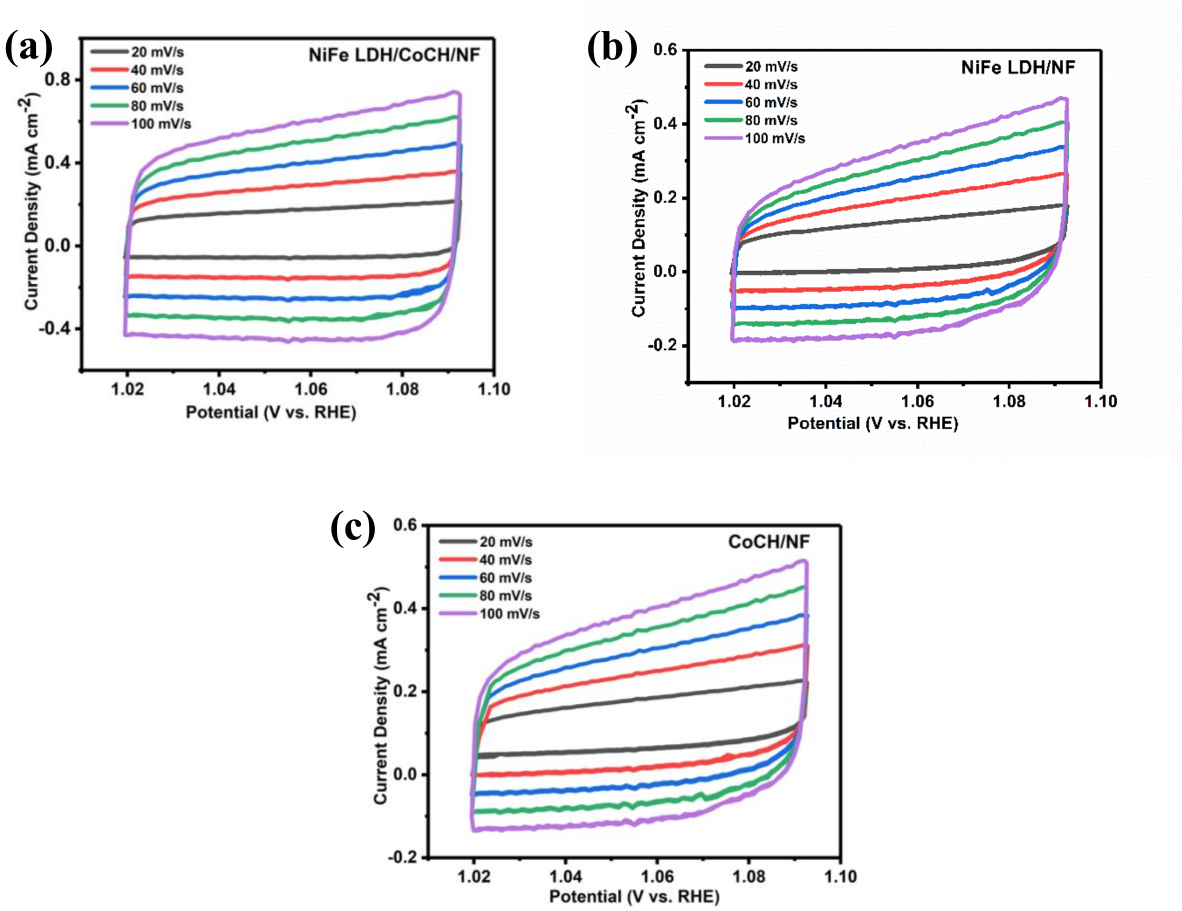

Figure S1. Cyclic voltammetry curves of different catalysts in 5 mM HMF solution with different sweep speeds

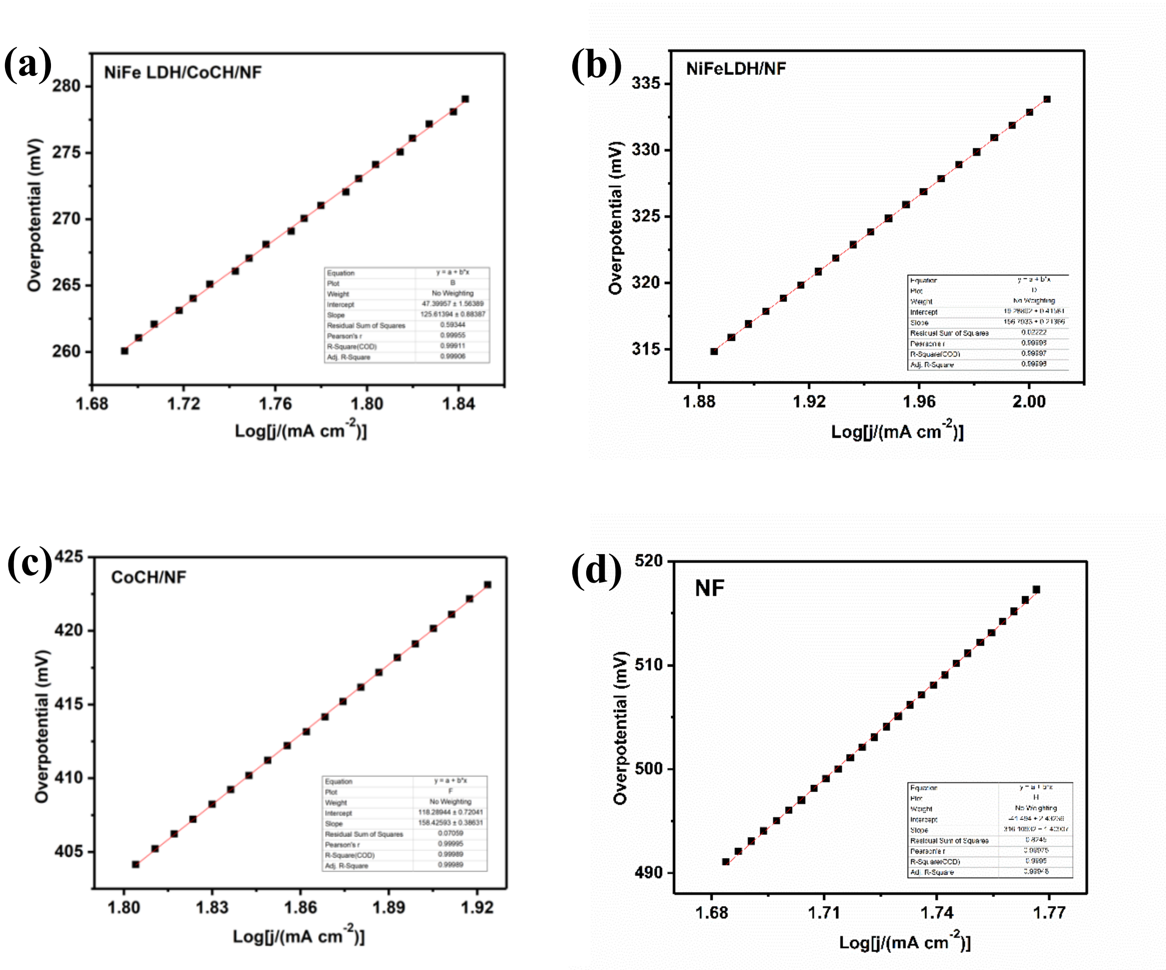

Figure S2. Tafel plot of NiFe LDH/CoCH/NF and other catalysts in 5 mM HMF solution.

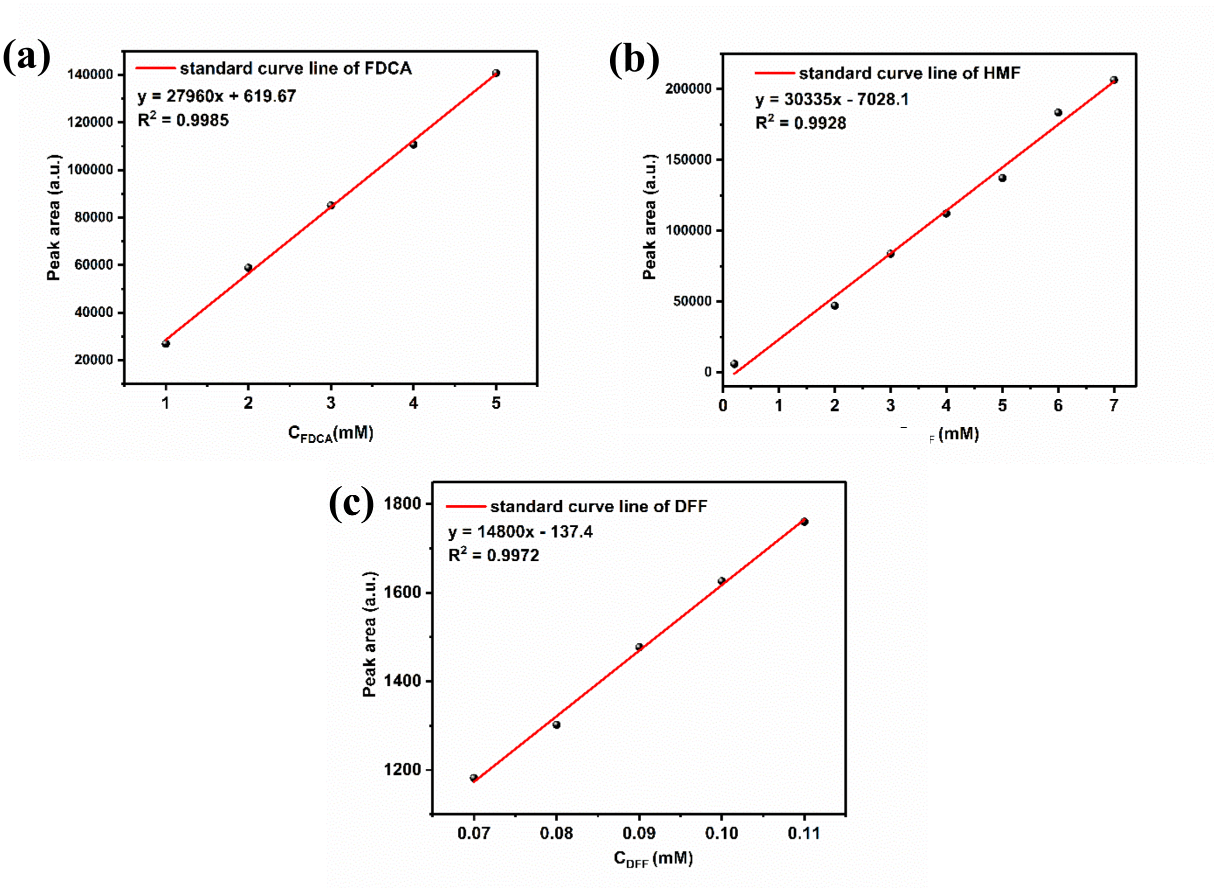

Figure S3. HPLC Calibration curves of (a) FDCA, (b) HMF, and (c) DFF.

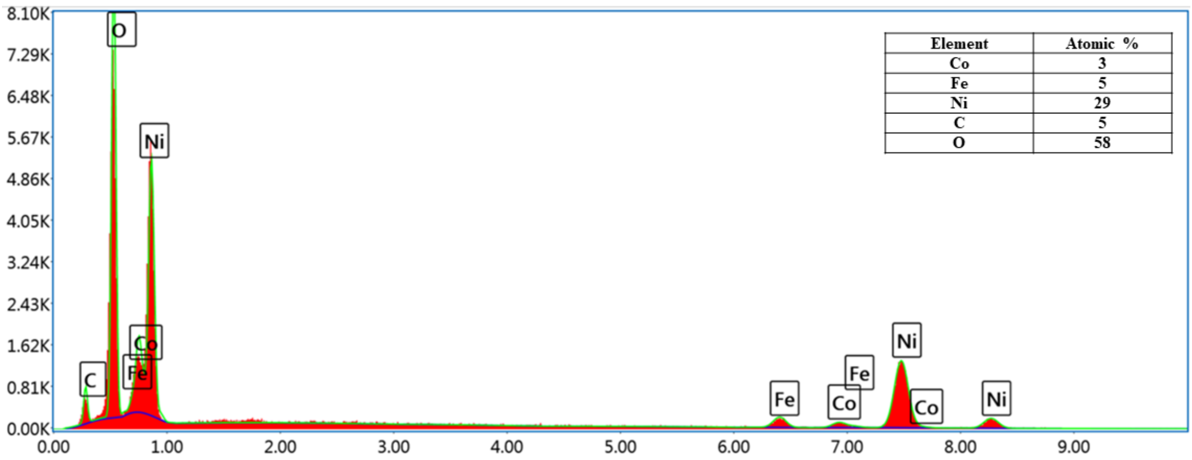

Figure S4. EDX result of the NiFe LDH/CoCH/NF sample.

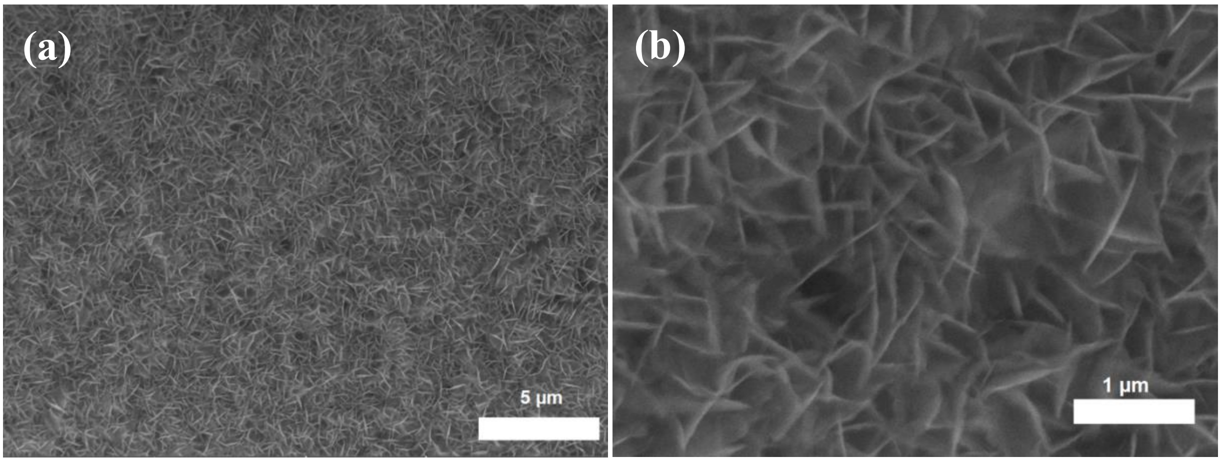

Figure S5. SEM images of NiFe LDH/CoCH/NF at low and high magnifications after 5 cycles of electrolytic HMF oxidations

Table S1. The values of Cdl and ECSA for of different catalysts in 5 mM HMF

Catalyst	Cdl (mF cm^{-2})	ECSA(cm^2)
NiFe LDH/CoCH/NF	10	250
NiFe LDH/NF	4.8	120
CoCH/NF	4.6	115

Table S2. Comparison of the NiFe LDH/CoCH/NF with other reported catalysts for electrocatalytic oxidation of HMF in alkaline electrolytes.

Catalyst	Electrolyte	Reaction time (min)	FDCA yield (%)	Faradaic Efficiency (%)	Ref.
NiFe LDH/CoCH/NF	1 M KOH + 5 mM HMF	90	98.6	98.1	This work
d-NiFe LDH/CP	1 M NaOH + 10 mM HMF	300	96.8	84.5	[1]
NiCoFe LDHs	1 M NaOH + 10 mM HMF	60	84.9	90	[2]
NiFe LDH	1 M KOH + 10 mM HMF	90	98	99.4	[3]
NiCoMn-LDHs/NF	1 M NaOH + 1 mM HMF	150	91.7	65	[4]
CoP–CoOOH	1M KOH + 150 mM HMF	1000	96.3	96.3	[5]
CoOOH	1 M KOH + 5 mM HMF	1320	35.1	35.1	[6]
$NiCO_2O_4$/NF	1M KOH + 5mM HMF	55	90.8	87.5	[7]
N-$NiMoO_4$/NF	1M KOH + 10mM HMF	120	97	91	[8]
Ni_2S_3/NF	1M KOH + 10mM HMF	120	98	94	[9]
S−Ni@C	1M KOH + 10mM HMF	270	96	96	[10]
NiO-N/C	1M KOH + 10mM HMF	120	84	96	[11]
$Ni_{0.9}Cu_{0.1}(OH)_2$	1M KOH + 5mM HMF	120	91.2	91.2	[12]

References

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