

Electrodeposited Nanostructured CoFe_2O_4 for Overall Water Splitting and Supercapacitor Applications

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Electronic Supplementary Information

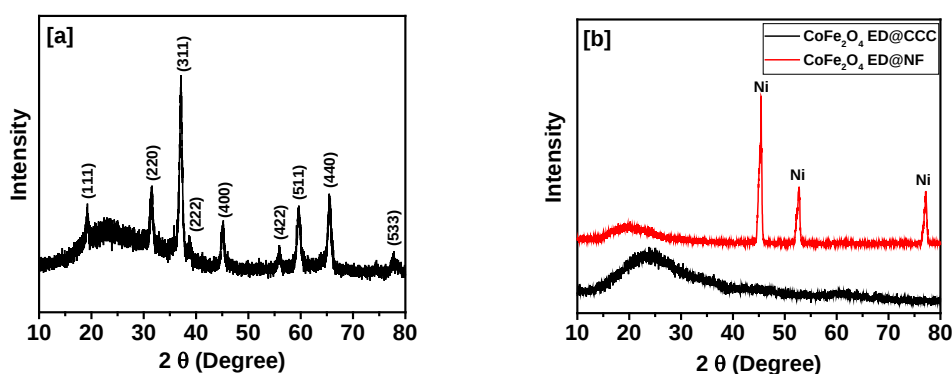


Figure. S1. XRD patterns of (a) CoFe_2O_4 , (b) CoFe_2O_4 ED@CCC and CoFe_2O_4 ED@NF.

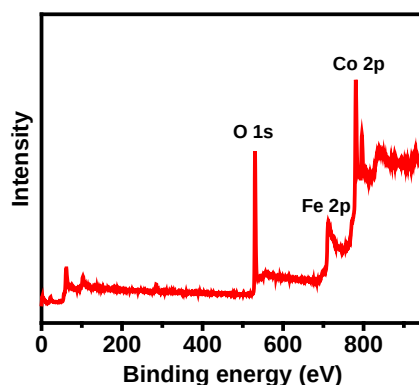


Figure. S2. XPS wide scan of the CoFe_2O_4 .

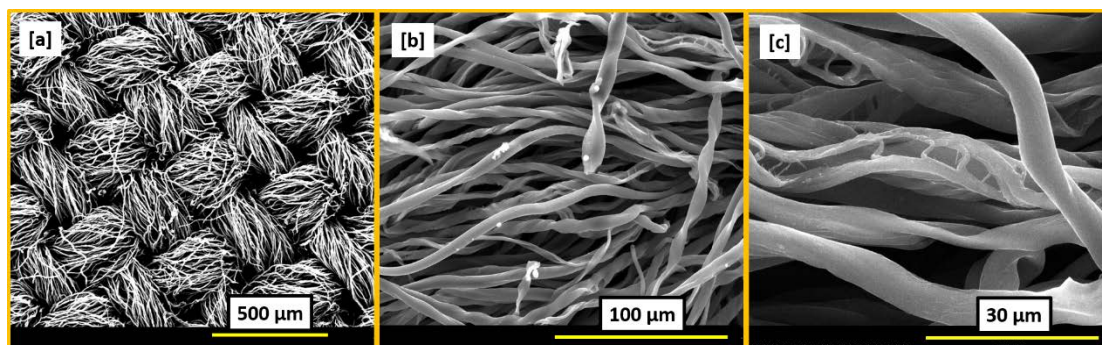


Figure. S3. SEM images of electrodeposited CoFe_2O_4 on carbonized carbon cloth.

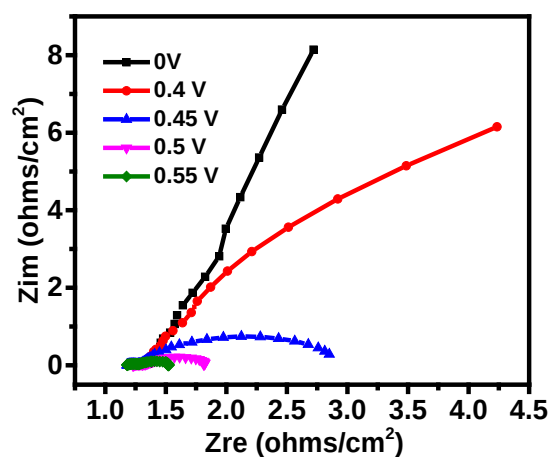


Figure. S4. Nyquist plots for the CoFe₂O₄ ED@NF sample at various potentials (vs. SCE).

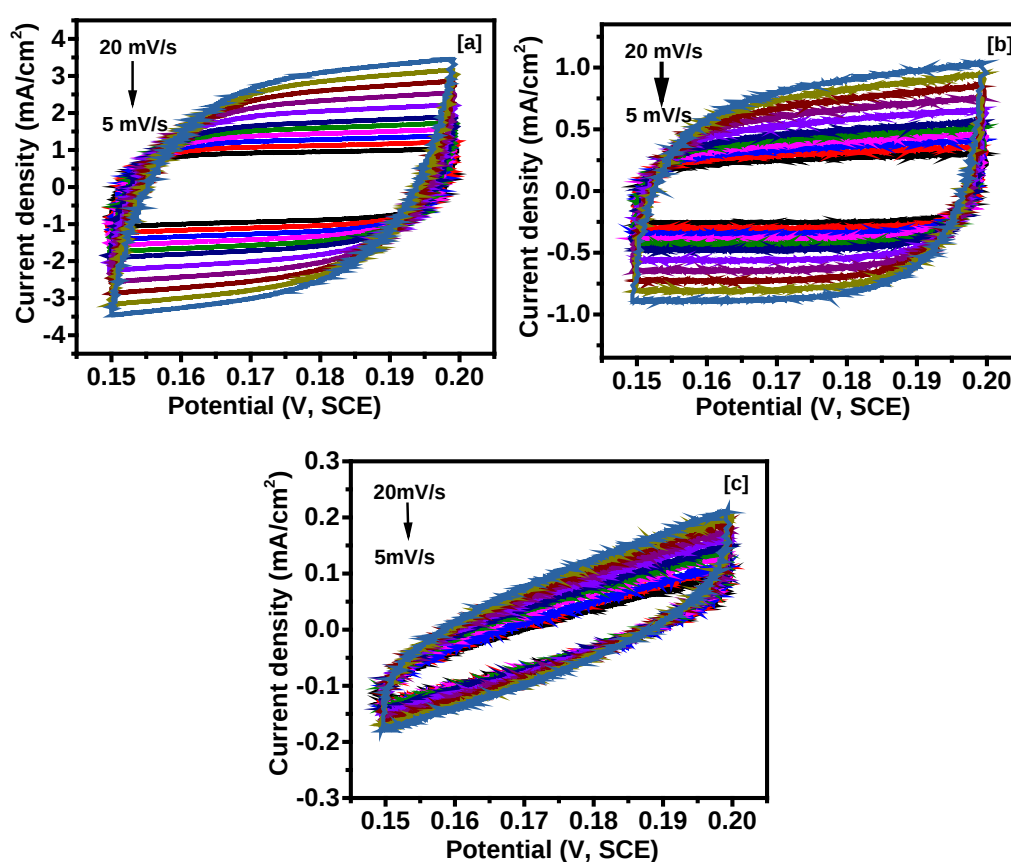
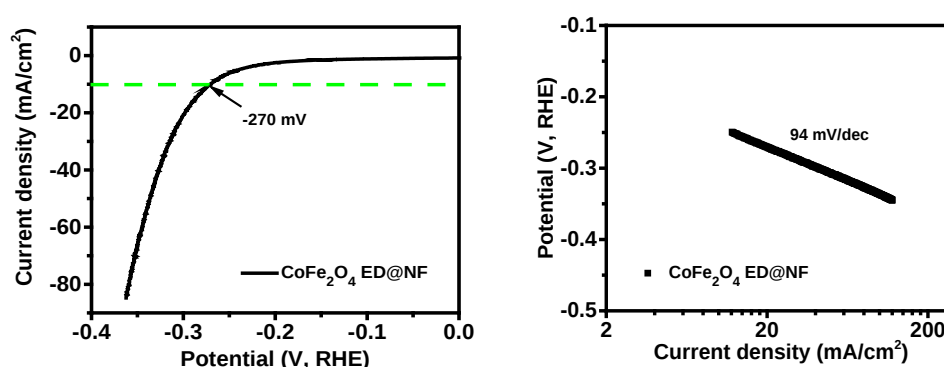


Figure. S5. CV curves in non-faradic region for (a) CoFe₂O₄ ED@NF, (b) CoFe₂O₄@NF, and (c) CoFe₂O₄ ED@CCC.



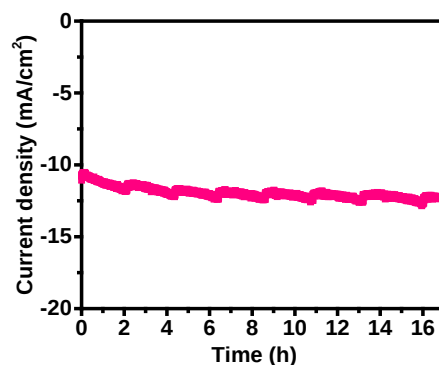


Figure. S6. (a): Polarization curves, (b) Tafel slopes, and (c) chronoamperometry data for CoFe₂O₄ ED@NF in HER range.

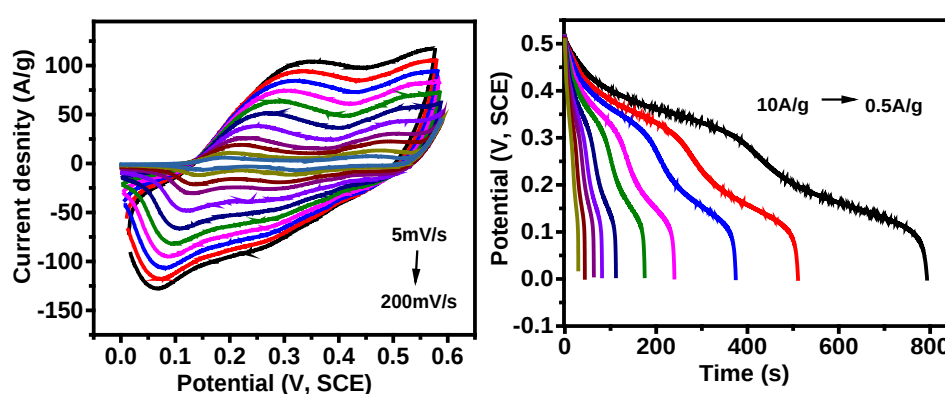


Figure. S7. (a) CV curves and (b) GCD curves of CoFe₂O₄ ED@NF obtained at various scan rates and current densities in 3M KOH electrolyte.

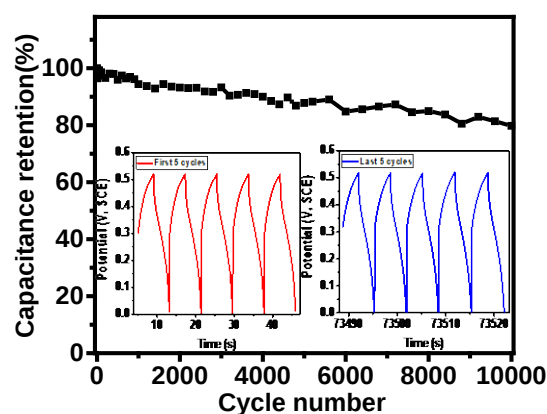


Figure. S8. Cyclic stability plot for CoFe₂O₄ ED@NF sample using 10,000 galvanostatic charge-discharge measurements.

Table S1. Comparison of OER performance of some recently reported FeCo-based electrocatalysts.

Catalyst	Overpotential (mV) at 10 mA/cm ²	Tafel slope (mV/dec)	Method	Substrate	Reference
CoFe ₂ O ₄ NPs	378	73	Hydrothermal	CFP	1
CoFe-LDH-continuous	314	60	Electrodeposition	GC	2
CoFe-LDH-pulsed 0.1	286	48	Electrodeposition	GC	2
CoFe ₂ O ₄ NF	~420	82	Electrospun	GC	3

CoFe ₂ O ₄ NP	~530	223	Electrospun	GC	3
CoFe ₂ O ₄ /rGO	~435	~	Hydrothermal	GC	4
CoFe ₂ O ₄ ED@CCC	410	119	Electrodeposition	CCC	This work
CoFe ₂ O ₄ @NF	308	47	Solvothermal	NF	This work
CoFe ₂ O ₄ ED@NF	270	31	Electrodeposition	NF	This work

Table S2. Comparison of HER performance of some recently reported electrocatalysts in alkaline media.

Catalyst	Overpotential (mV) at -10 mA/cm ²	Tafel slope (mV/decade)	Reference
Zn-Co-S nanosheets	-415	139	5
Zn-Co-S nanoplates	-304	131	5
Zn-Co-S nanoneedles	-234	109	5
CP/Co-S	-350	138	6
CP/CTs/Co-S	-250	131	6
EG/Co _{0.85} Se	~320	223	7
EG/NiFe-LDH	~380	125	7
EG/Co _{0.85} Se/NiFe-LDH	-260	160	7
Co-NRCNTs	-370	-	8
Ni _{0.9} Fe _{0.1} /NC	-231	111	9
CoFe ₂ O ₄ ED@NF	-270	94	This work

Table S3. Comparison of specific capacitances of some reported FeCo-based samples.

Samples	Highest specific capacitance (F/g)	Method	Reference
Flower-like CoFe ₂ O ₄ /FeOOH	332.4	One-pot controllable synthesis	10
CoFe ₂ O ₄ nanoparticles	356	Wet chemical method	11
Spinel CoFe ₂ O ₄ nano- flakes	366	Chemical synthesis from an alkaline bath	12
RGO-CoFe ₂ O ₄	123	Coprecipitation method	13
CoFe ₂ O ₄ nanoparticles	142	Coprecipitation method	14
Co/Fe/CoFe ₂ O ₄	394	Water–gas shift reaction	15
CoFe ₂ O ₄ ED@NF	768	Electrodeposition	This work

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