

Supplementary information

Iron Oxide@CoFe-LDH Nanocomposites for Highly Stable Aqueous Hybrid Supercapacitor

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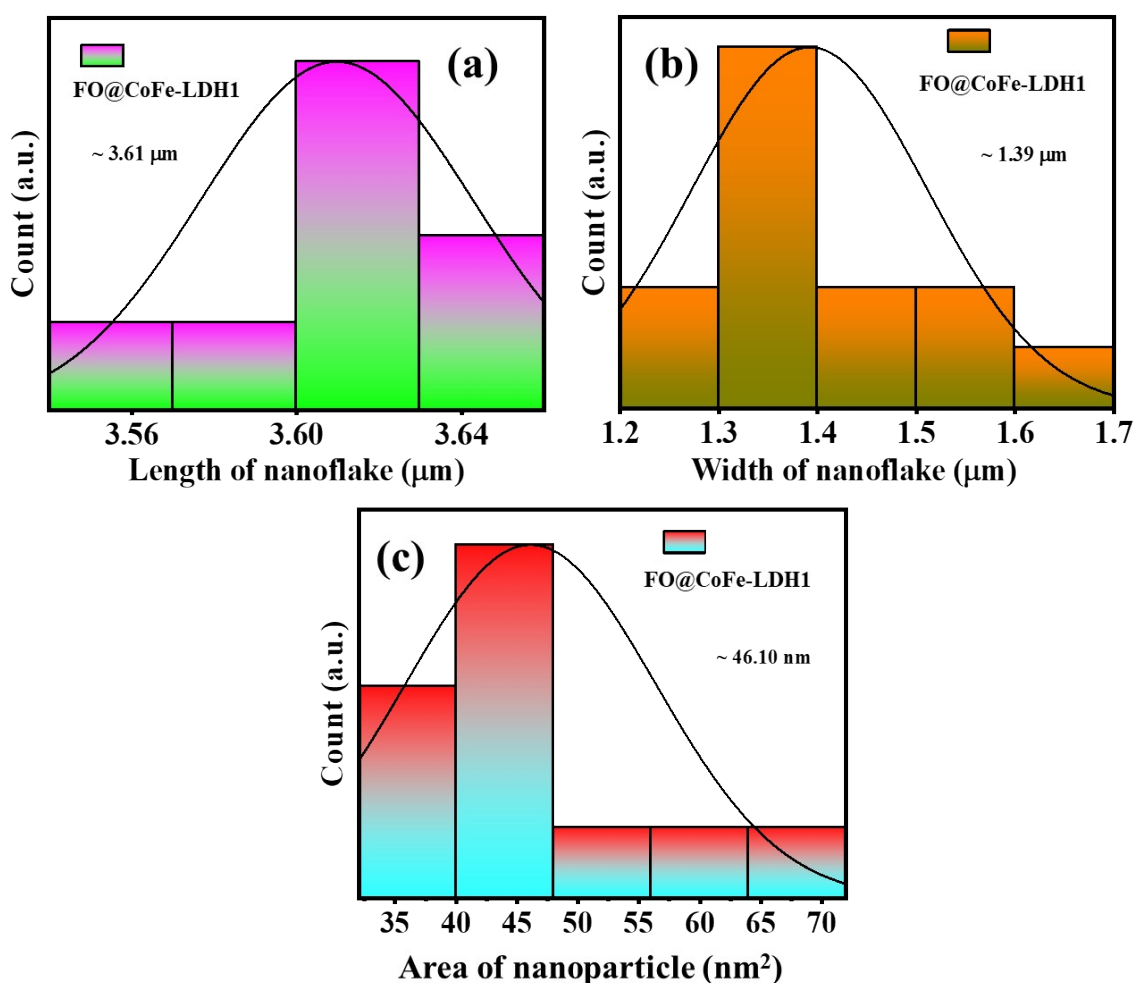


Fig. S1 Histogram of length of flake (a), width of flake (b), area of nanoparticle (c) respectively.

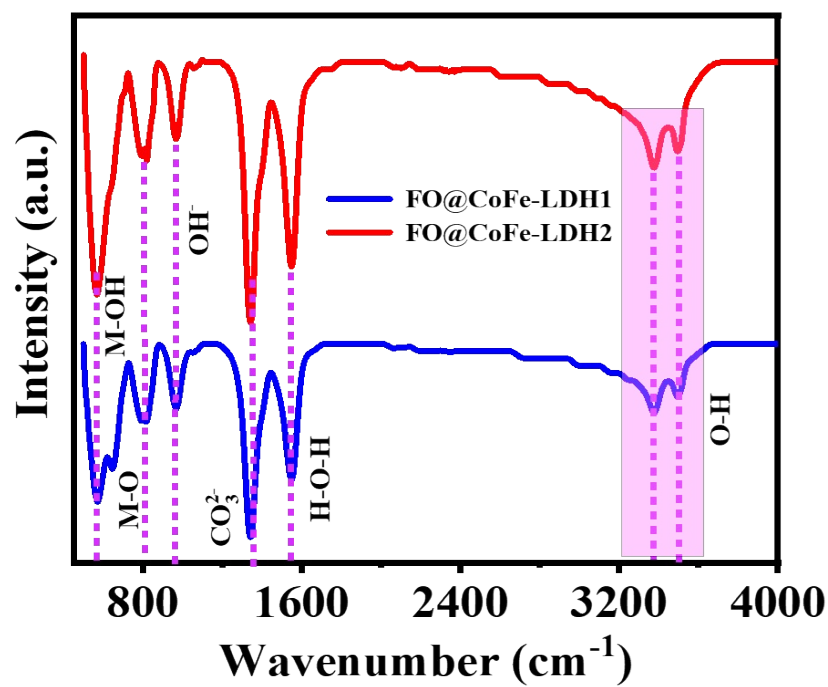


Fig. S2 (a) FT-IR spectra of FO@CoFe-LDH1 and FO@CoFe-LDH2.

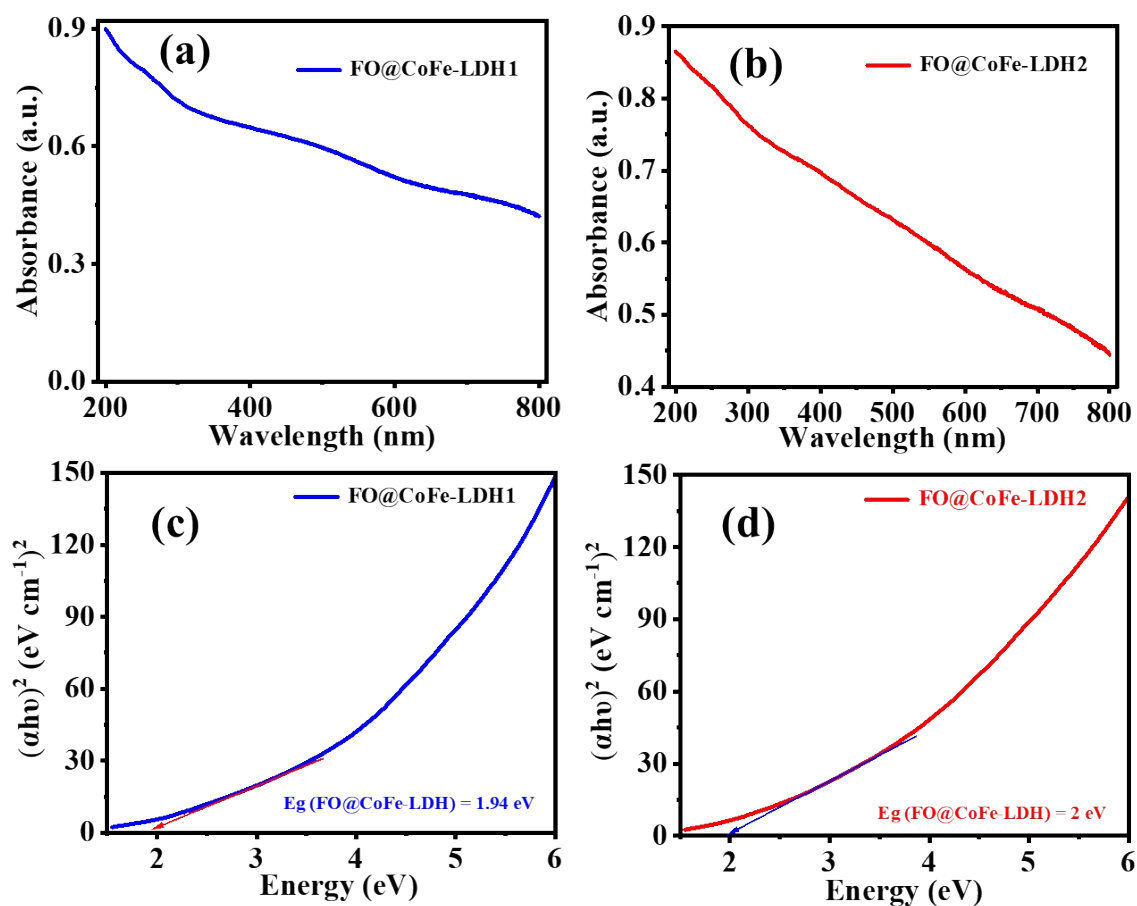


Fig. S3 (a,b) Absorbance spectra, (c, d) Tauc plot of FO@CoFe-LDH1 and FO@CoFe-LDH2 respectively.

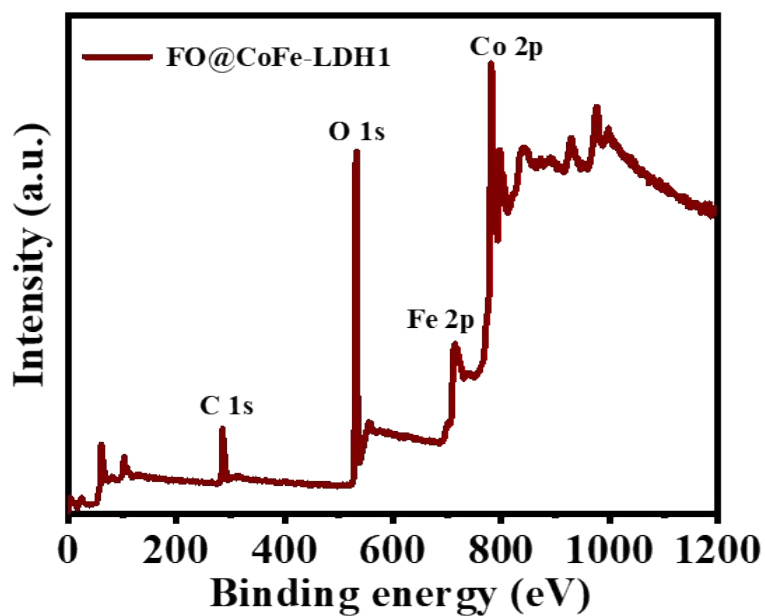


Fig. S4 XPS spectra survey scan of FO@CoFe-LDH1

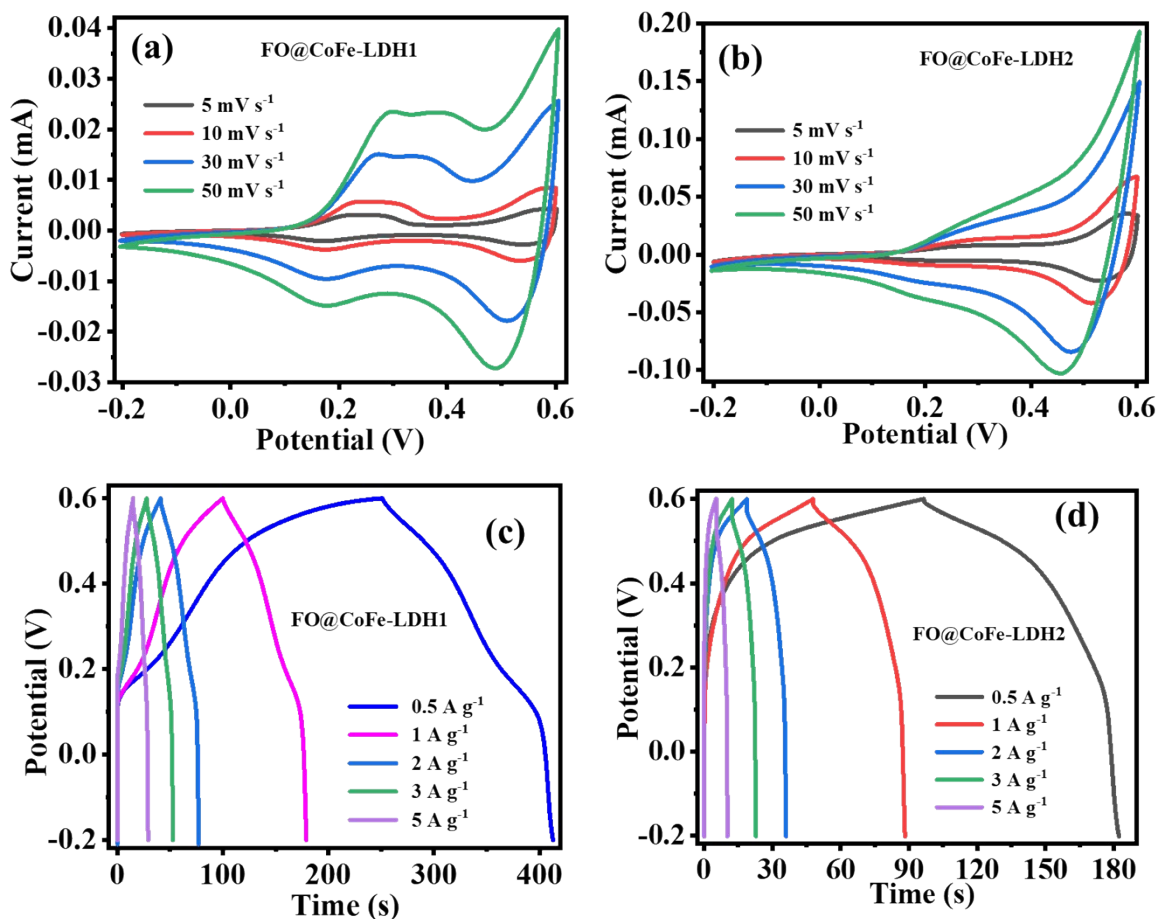


Fig. S5 (a, b) CV curves at various scan rates, (c, d) GCD curves at various current densities of FO@CoFe-LDH1 and FO-CoFe-LDH2 respectively.

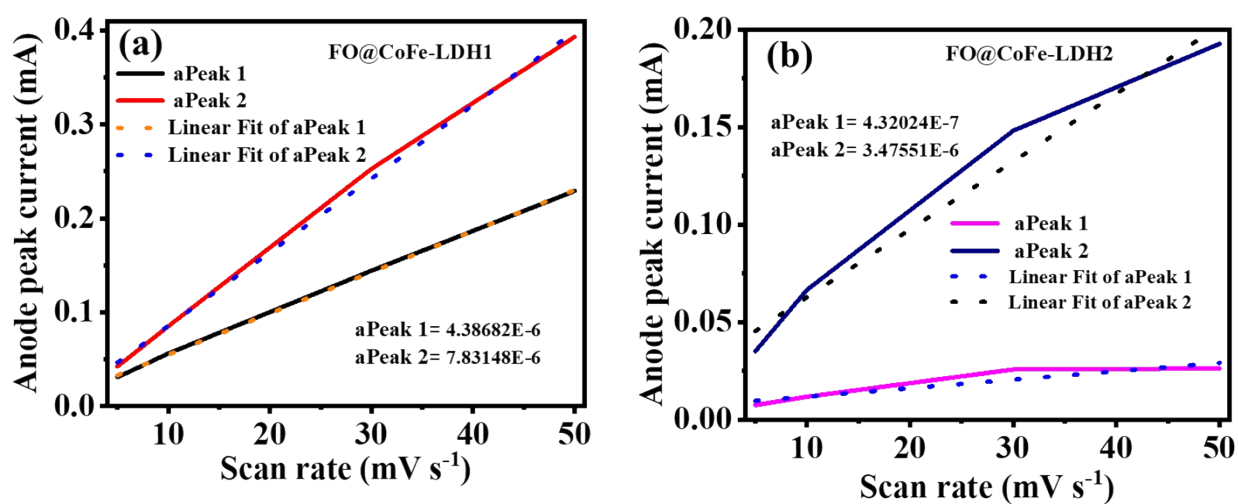


Fig. S6 Scan rate vs anode peak current of FO@CoFe-LDH1 (a) and FO@CoFe-LDH2 (b).

Table (S1): Electrochemical results of FO@CoFe-LDH1 and FO@CoFe-LDH2 by three electrodes.

Sr. No.	Sample	Electrolyte	Potential	C_s (C. g ⁻¹)	R_s (Ω)	R_{ct} (Ω)	Z_w (Ω)
1.	FO@CoFe-LDH1	6 M KOH	-0.2 V to 0.6 V	84 @ 1 A g ⁻¹	5.07	66.69	66.76
2.	FO@CoFe-LDH2	6 M KOH	-0.2 V to 0.6 V	25 @ 1 A g ⁻¹	6.08	866.95	876.00

Table (S2): Comparison of available literature of CoFe-LDH and its composites.

Sr. No.	Material	Method	Morphology	Electrolyte	C_s (F g ⁻¹)	Stability (%)	Ref.
1	CoFe-LDH	Reflux	Hexagonal nanosheet	6 M KOH	2358.4 @ 0.5 A g ⁻¹	83 @ 1400 cycles	¹
2	CoFe-LDH	Coprecipitate	Platelet	1 M KOH	145 F g ⁻¹ @ 1 A g ⁻¹	~100 @100	²
3	MgCo ₂ O ₄ @CoFe-LDH	Hydrothermal	Nanorod/ Nanosheet	6 M KOH	2007 F g ⁻¹ @ 1 A g ⁻¹	80.2 @ 5000 cycles	³
4	FO@CoFe-LDH2	Hydrothermal	Nanoplate/ Nanoflake	6 M KOH	25 C. g ⁻¹ @ 1 A g ⁻¹	-	This work
5	FO@CoFe-LDH1	Hydrothermal	Nanoplate/ Nanoflake	6 M KOH	84 C. g ⁻¹ @ 1 A g ⁻¹	99.9 @ 4000 cycles	

References

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- 2 G. Abellán, J. A. Carrasco, E. Coronado, J. Romero and M. Varela, *J. Mater. Chem. C*, 2014, **2**, 3723–3731.
- 3 Z. Liu, Y. Liu, Y. Zhong, L. Cui, W. Yang, J. M. Razal, C. J. Barrow and J. Liu, *J. Power Sources*, 2021, **484**, 229288.