Supplementary Information

Carbon felt with acid treatment as highly active metal-free electrocatalyst for selective hydrogenation of cinnamaldehyde to hydrocinnamaldehyde

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Table S1 Results of electrochemical hydrogenation of CAL on carbon-based electrodes.

Cathode catalyst	Reaction medium	Substrate concentration	Hydrogroup	Conv. (%)	Sel. (%)	FE (%)	Ref.
CFn	0.2 M $NaClO_4$+ 0.2 M H_2SO_4	0.06 M	C=C	32.1	81.5	85.7	This work
Pt-MoO_3/C	0.1 M HCl	0.02 M	C=O	99	78	50	[1]
MoS_2/CFC	0.1 M PBS	0.012 M	C=O	88.8	~50	~15	[2]
CoS/*oms*-NSC	1.0 M PBS + CH_3CN	0.01 M	C=C	89.6	92.1	40	[3]

References

[1] J. L. Wang, M. Jin, Y. Y. Sun and H. M. Zhang, *Chem. Commun.*, 2022, **58**, 6721-6724.

[2] T. X. Wu and M. M. Han, *Mater. Adv.*, 2022, **3**, 8250.

[3] X. S. Yuan, S. H. Zhou, S. W. Wang, W. B. Wei, X. F. Li, X. T. Wu and Q. L. Zhu, *Appl. Catal. B Environ. Energy*, 2025, **361**, 124642.

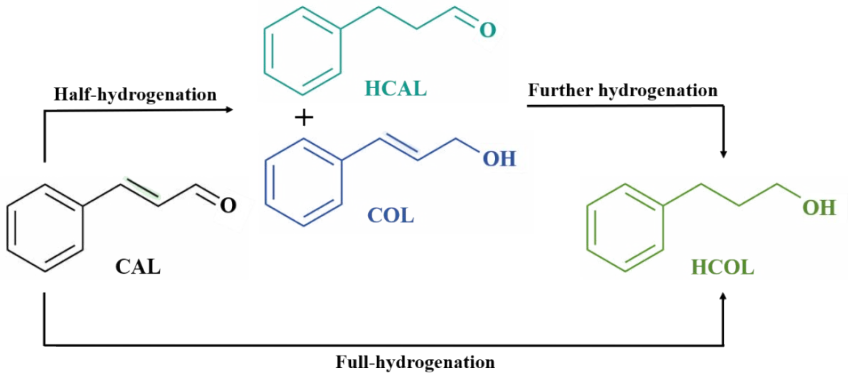

Fig. S1 Schematic illustration of the main hydrogenation pathways for CAL.

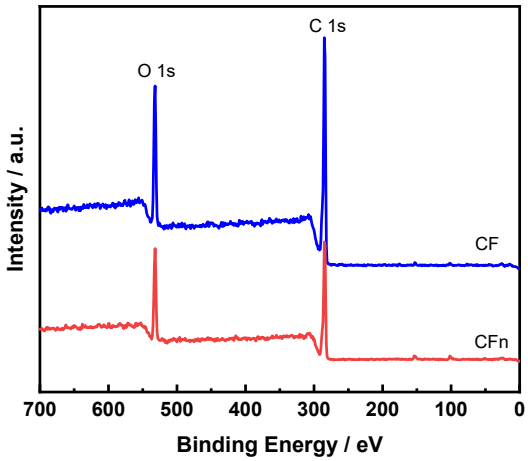

Fig. S2 XPS survey spectra of CF and CFn.

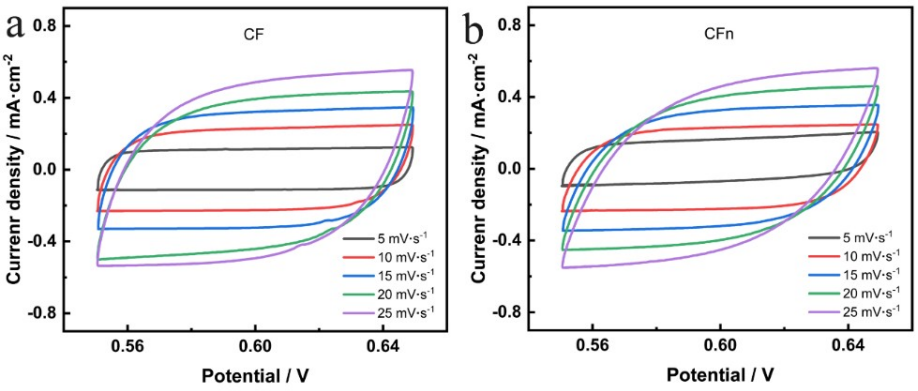

Fig. S3 CV curves for a) CF and b) CFn in a potential window of 0.55 V~0.65 V vs. SCE at various scan rates.

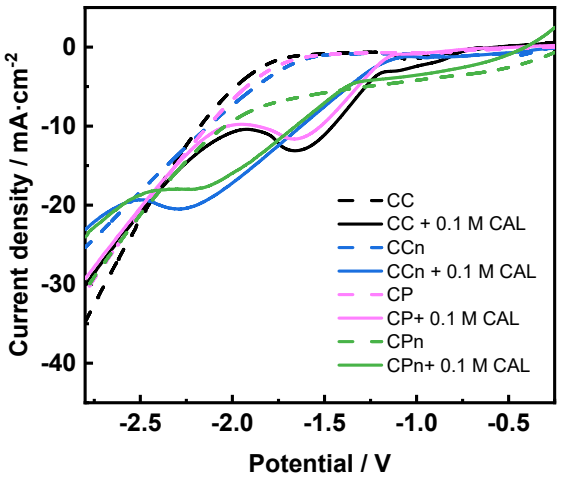

Fig. S4 LSV curves of CC, CP, CCn and CPn without and with CAL.

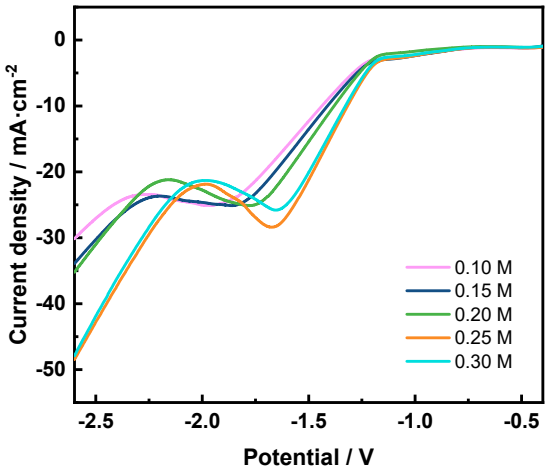

Fig. S5 LSV curves of CFn with 0.06 M CAL at different $NaClO_4$ concentrations.

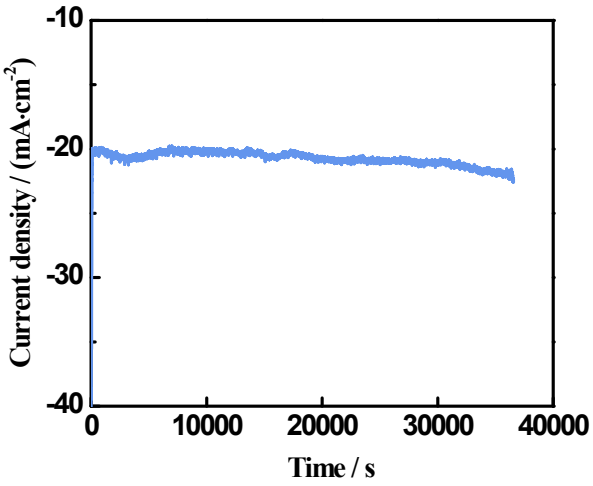

Fig. S6 Long-term CAL electrochemical hydrogenation test of CFn catalyst.

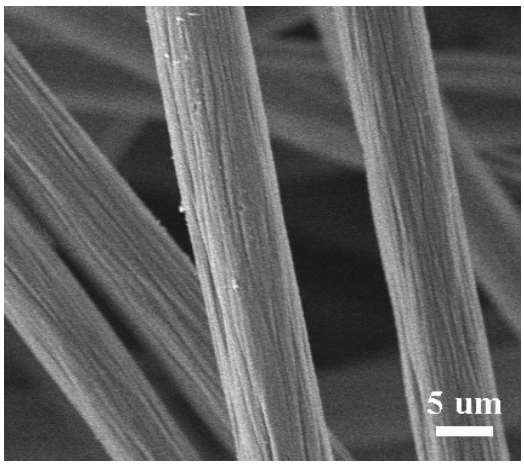

Fig. S7 SEM image of the recovered CFn

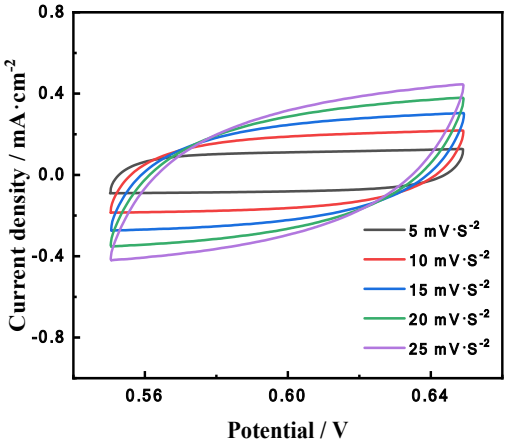

Fig. S8 CV curves for the recovered CFn in a potential window of 0.55 V~0.65 V vs. SCE at various scan rates.

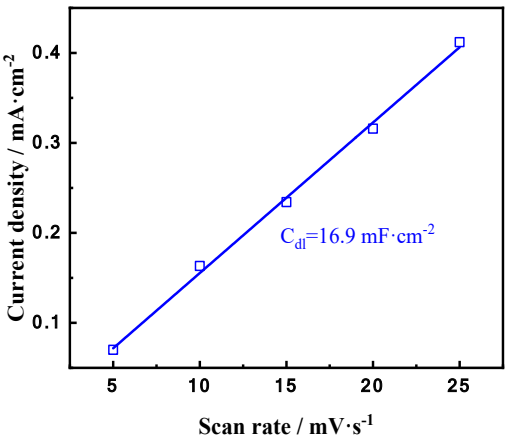

Fig. S9 Dependence of capacitive current on scan rate over the recovered CFn