Supplementary Material

Hydrothermally Synthesized Cerium Phosphate with Functionalized Carbon Nanofiber Nanocomposite for Enhanced Electrochemical Detection of Hypoxanthine

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Materials Characterizations: Vesta software is utilized to analyze the crystal structure, with the Bruker AXS D8 advanced instrument X-ray diffractometer being used to identify the phase configuration using CuKα radiation (λ = 1.5405Å). The microstructures were examined using an energy-dispersive X-ray spectroscope (7200-H, HORIBA) and a SEM apparatus (JSM-6510LV, JEOL) operating at 15 kV and 10 µA. Electrochemical impedance spectroscopy (EIS) via Autolab (PGSTAT204) was used to investigate the electrochemical characteristics. The CHI 1211C electrocatalytic workstation can be used to perform electrochemical experiments in a traditional three-electrode cell, such as cyclic voltammetry (CV) and differential plus voltammetry (DPV). In this scenario, the working, reference, and counter electrodes were used as GCE (geometrical surface area = 0.071 cm2), saturated Ag/AgCl, and Pt wire, respectively.

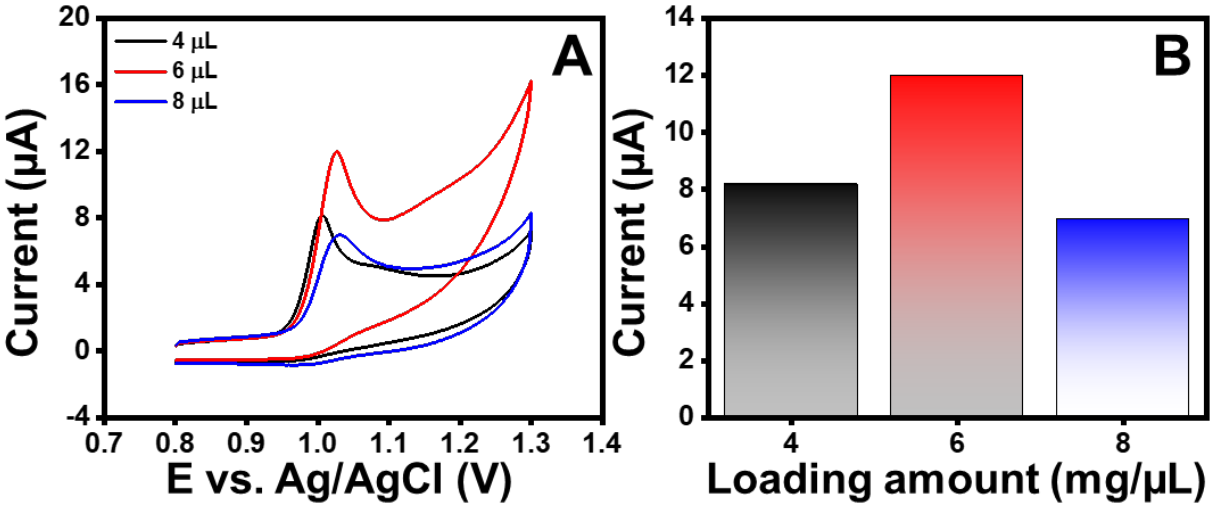

Figure S1. (**A**) CV curves for various loading amounts of $CePO_4$@*f*-CNF towards the detection of hypoxanthine in 0.1 M PB (pH-7.0). (**B**) Respective bar diagram for various loading amounts.

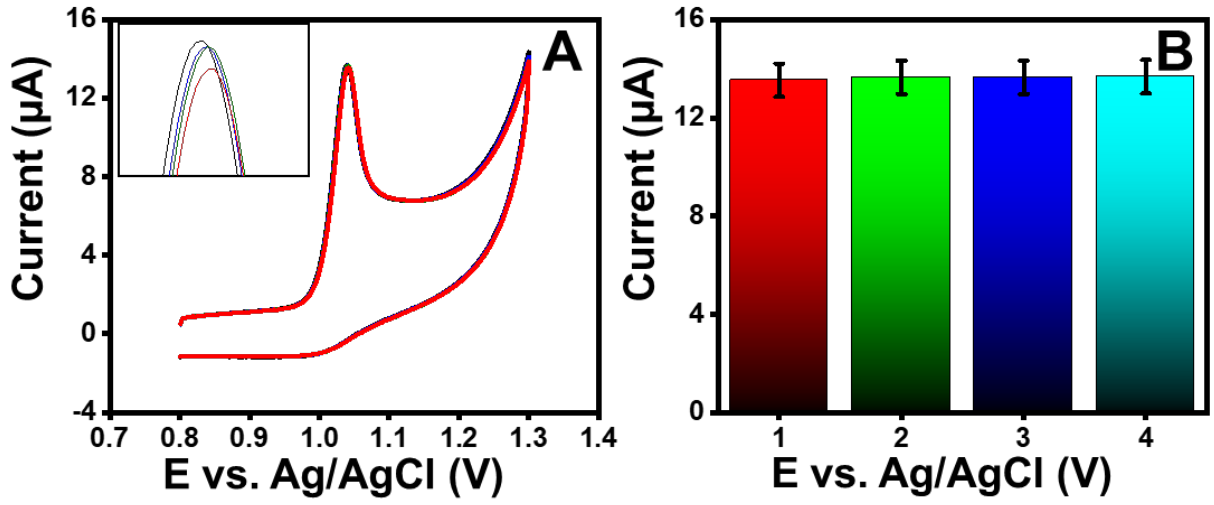

Figure S2. (**A**) and (**B**) CV curves for a repeatability study towards HXA in electrolyte PB (pH-7.0) and respective bar diagram.

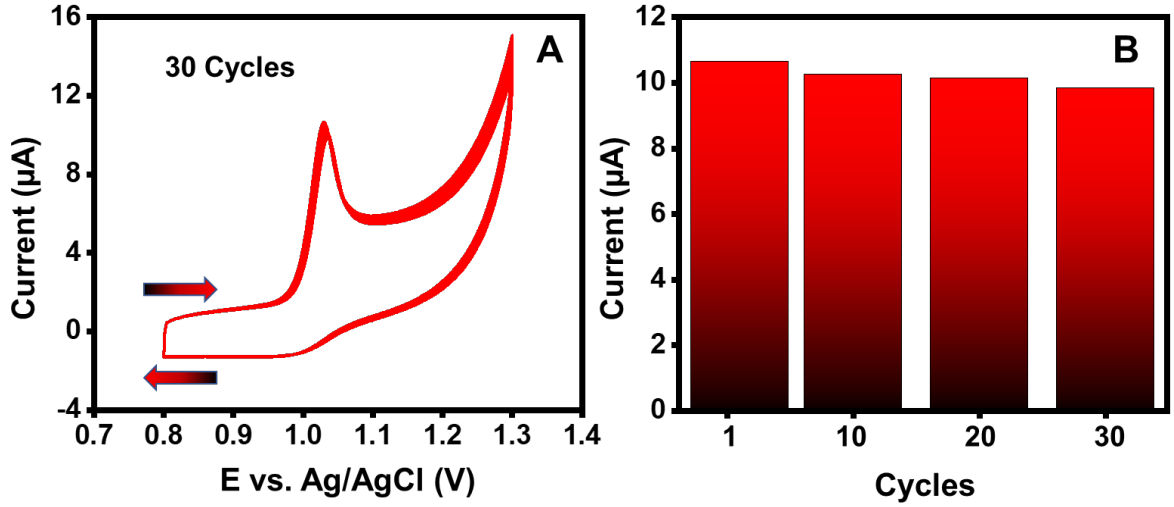

Figure S3. (A,B). Cycle stability of $CePO_4$@*f*-CNF with the presence of hypoxanthine, with a bar diagram.

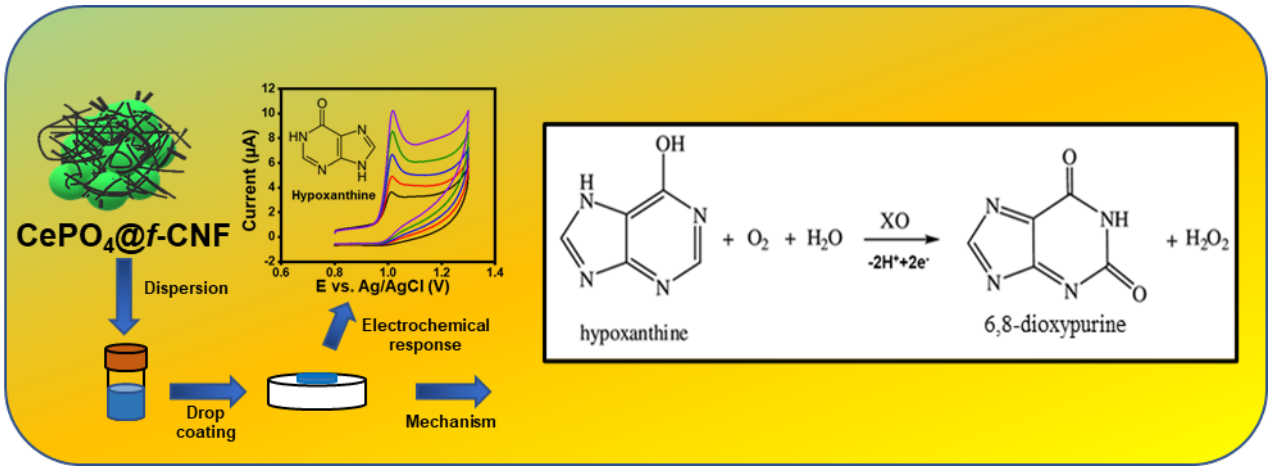

Figure S4. Possible electro-oxidation mechanism of hypoxanthine.

Table S1. Crystallographic analysis of $CePO_4$ peak position (2θ°) and lattice planes (hkl) value.

Sr. No.	2θ°	hkl	Sr. No	2θ°	hkl
1	21.3	111	10	46.2	212
2	25.2	111	11	48.6	132
3	27	200	12	50.8	023
4	28.9	120	13	51.9	322
5	31.2	012	14	52.6	132
6	34.5	202	15	54.2	140
7	36.8	112	16	60.4	014
8	41	130	17	70.2	124
9	42.1	103	18	77.2	513

Table S2. Summarized R_{ct} values obtained from different modified electrodes.

Electrode	Rct (Ω.cm²)
f-CNF/GCE	331.82
$CePO_4$/GCE	767.87
$CePO_4$@*f*-CNF/GCE	253.24

Table S3. Comparison of the proposed method with other electrochemical methods for the determination of HX.

Sensing materials	Method of detection	pH	Linear range(μM)	LOD	Ref.
4B-PGE	DPV	7.4 PBS	6–30	1.09	[1]
Co-CeO_2/GCE	DPV	5.0 PBS	1–600	0.36	[2]
Nf-(RuDMSO-Cl-H_2O)-MME/GCE	DPV	7.0 PBS	50–300	2.37	[3]
MWCNT/GCE	DPV	7.14 PBS	10–150	2.87	[4]
GMC/GCE	DPV	7.0 PBS	20–240	0.35	[5]
Poly(xylitol)/GCE	DPV	5 PBS	5–55	4.5	[6]
NSPE[a]	DPV	7.5 PBS	4–30	0.34	[7]
HDA/ERGO/GCE[h]	DPV	7.2 PBS	5–300	0.32	[8]
Nontronite/SPCE	SWV	6.0 PBS	4-30	0.42	[7]
$CePO_4$@*f*-CNF	DPV	7.0 PBS	2.05–629	0.23	This work

References

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