Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information

Alkaline earth metal stannate $TSnO_3$ (T = Ca and Sr) entrapped functionalized carbon nanofiber composites: active electrocatalysts for the determination of hydroxychloroquine in environmental samples

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***Materials Characterizations**:* Phase configuration is identified using Bruker D2 Phaser advance instrument X-ray diffractometer though CuKα radiation (λ = 1.5405Å) whereas crystal structure is determined using Vesta software. Perkin Elmer spectrometer is employed to record Fourier transform infrared spectra in the range of 400-4000 cm^{-1}. The microstructure and the elemental composition of the as-prepared materials were studied employing a high resolution (HR) transmission electron microscope (TEM) (JEOL JEM-2100F (HR)) operating at 200 kV and by energy-dispersive X-ray spectroscopy using EDAX AMETEK Inc., DigitalMicrograph® software. X-ray photoelectron spectroscopy ESCA/Auger Laboratory is applied to quantitatively analyse the chemical composition of the materials while the electrochemical properties are explored using electrochemical impedance spectroscopy (EIS) through Autolab (PGSTAT204). CHI 1211c electrocatalytic workstation is functional to carry out the electrochemical measurements like cyclic voltammetry (CV) and Amperometric (i-t) in a conventional three electrode cell. Here, the GCE (geometrical surface area = 0.071 cm^2), saturated Ag|AgCl and Pt wire are active as working, reference and counter electrodes, respectively.

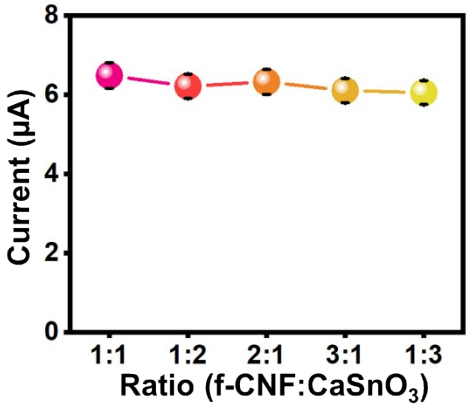

Figure S1. Composite preparation

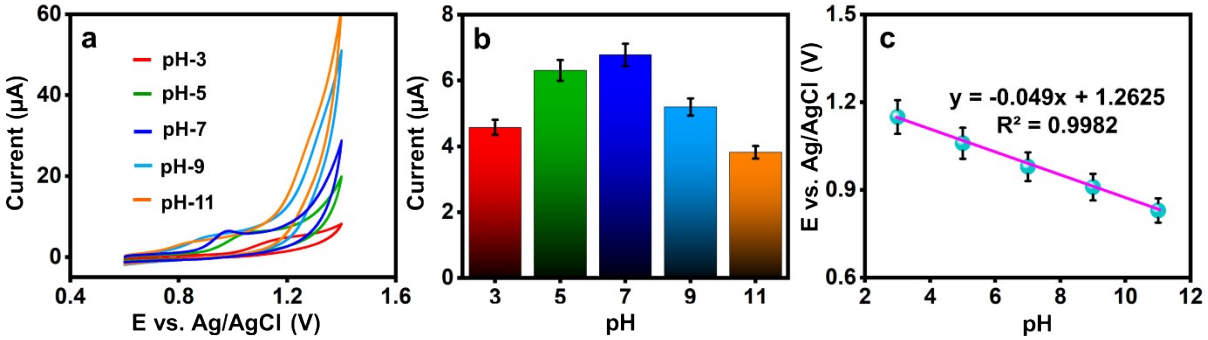

Figure S1. (a-c) Effect on various supporting electrolyte in the presence of HCQ at $CaSnO_3$/f-CNF.

Table S1. An overview on recently reported nanomaterial-based electrochemical methods for the determination of HCQ.

Materials	**Method**	**Linear ranges (µM)**	**LOD (µM)**	**Real samples**	**Ref.**
MWCNTs	AdSDPV	0.57–100	0.006	pharmaceutical formulations and biological fluids	S1
VS_2 QD/N, S@ GNA/CNTs	DPV	0.84–22.5	0.277	biological fluids	S2
PMPDA-SAM/GCE	DPV	0.05–12.8 12.3-111	0.00451	human body fluids	S3
BDDE	SWV	0.1–1.9	0.06	synthetic urine samples	S4
Schiff's base modified GCE	DPV	0.007-11.9	0.0047	human blood serum	S5
β-CD-AuNP	DPV	0.01–0.05	0.00261	pharmaceutical samples	S6
Cathodic treated boron diamond	SWV	0.29–5.66	0.18	pharmaceutical (tablets)	S7
$NaNbO_3$@f-CNF/GCE	*i-t*	0.006–35	0.007	Water bodies	S8
$CaSnO_3$@*f*-CNF/GCE	***i-t***	**0.001-129.5**	**0.0045**	**Water bodies**	**This work**

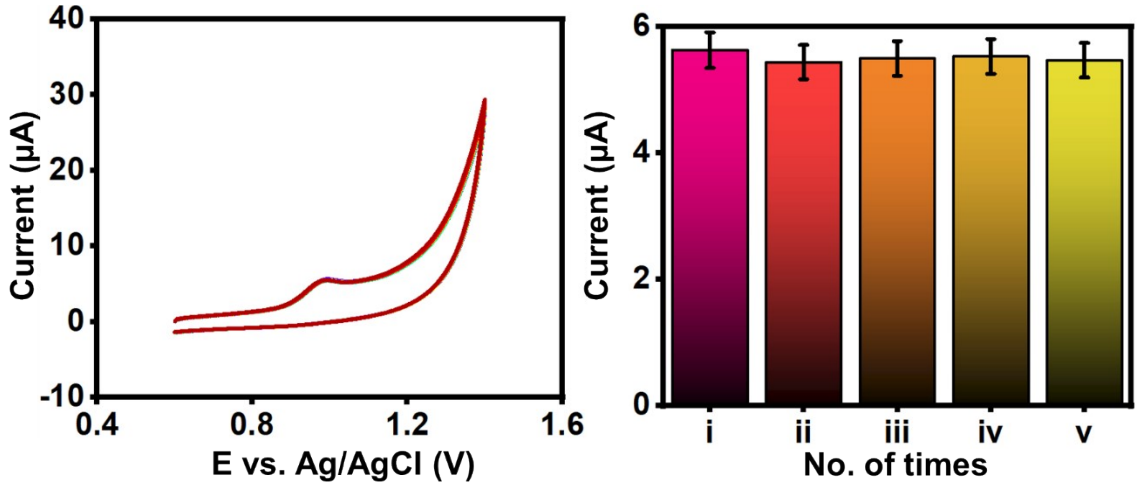

Figure S2. Repeatability analysis of $CaSnO_3$/f-CNF with the presence of HCQ (20 μM).

Reference

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S3. Khoobi, A., Ghoreishi, S.M., Behpour, M., Shaterian, M. and Salavati-Niasari, M., 2014. Design and evaluation of a highly sensitive nanostructure-based surface modification of glassy carbon electrode for electrochemical studies of hydroxychloroquine in the presence of acetaminophen. Colloids and Surfaces B: Biointerfaces, 123, pp.648-656.

S4. Deroco, P.B., Vicentini, F.C., Oliveira, G.G., Rocha-Filho, R.C. and Fatibello-Filho, O., 2014. Square-wave voltammetric determination of hydroxychloroquine in pharmaceutical and synthetic urine samples using a cathodically pretreated boron-doped diamond electrode. Journal of Electroanalytical Chemistry, 719, pp.19-23.

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