Supporting Information

Fabrication of tin sulfide/functionalized carbon nanofiber composite for the electrochemical detection of oxidative stress biomarker– trolox

Dhanashri D. Khandagale[a], Sea-Fue Wang[a,]*

[a]Department of Materials and Mineral Resources Engineering, National Taipei University of Technology, Taipei 106, Taiwan.

***Corresponding author:**
Sea-Fue Wang, Email: sfwang@ntut.edu.tw

***Materials Characterizations**:* Phase configuration is identified using Bruker AXS D8 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}. An SEM instrument (JSM-6510LV, JEOL) operated at 15 kV and 10 μA and an energy-dispersive X-ray spectroscope (7200-H, HORIBA) were used to examine the microstructures. 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), differential plus voltammetry (DPV) 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.

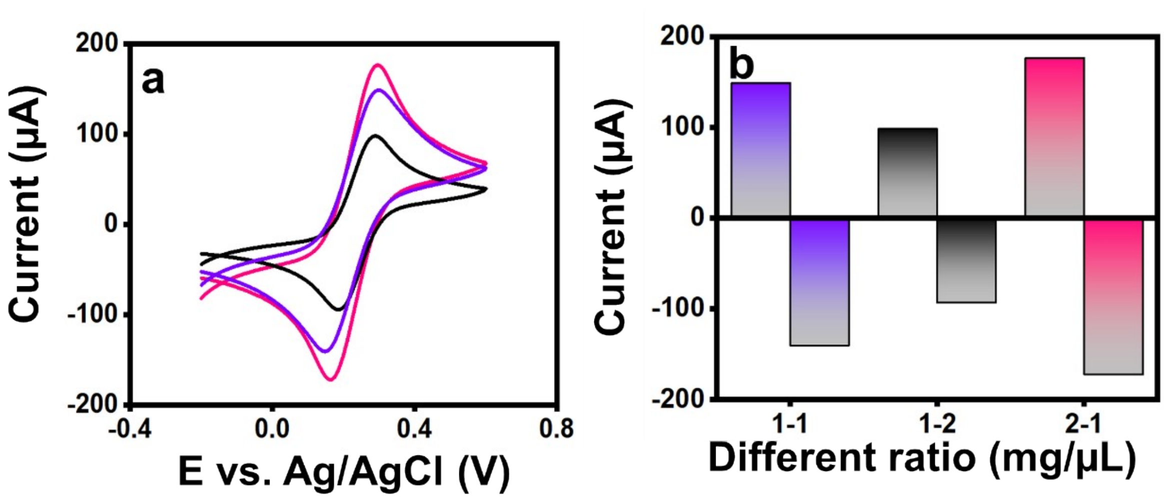

Figure S1. (a) CV curves of different ratio in the presence of $[Fe(CN)_6]^{3-/4-}$. **(b)** Respective bar diagram.

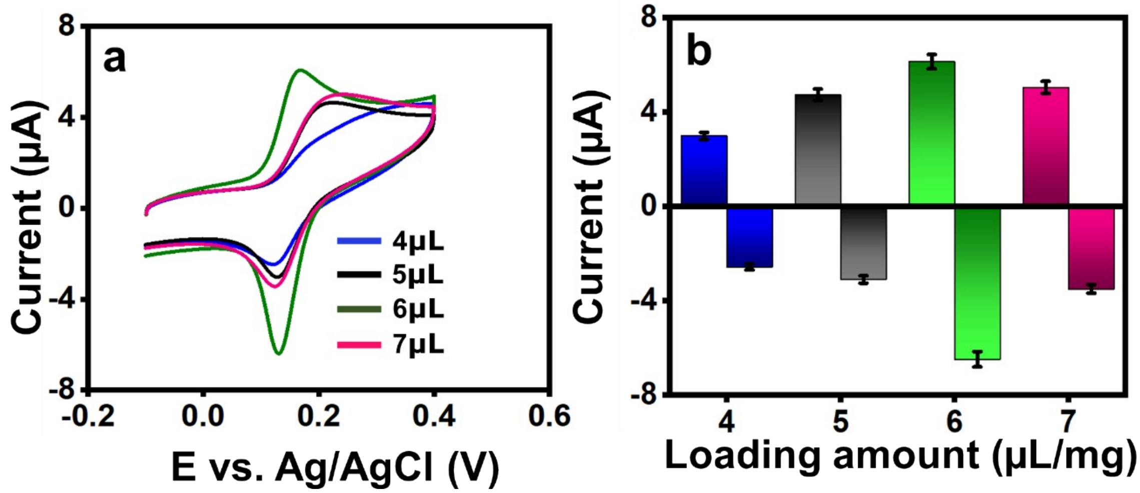

Figure S2. (a) CV curves for various loading amount of SnS@f-CNF towards detection of trolox in 0.1 M PB (pH-7.0). **(b)** Respective bar diagram for various loading amount.

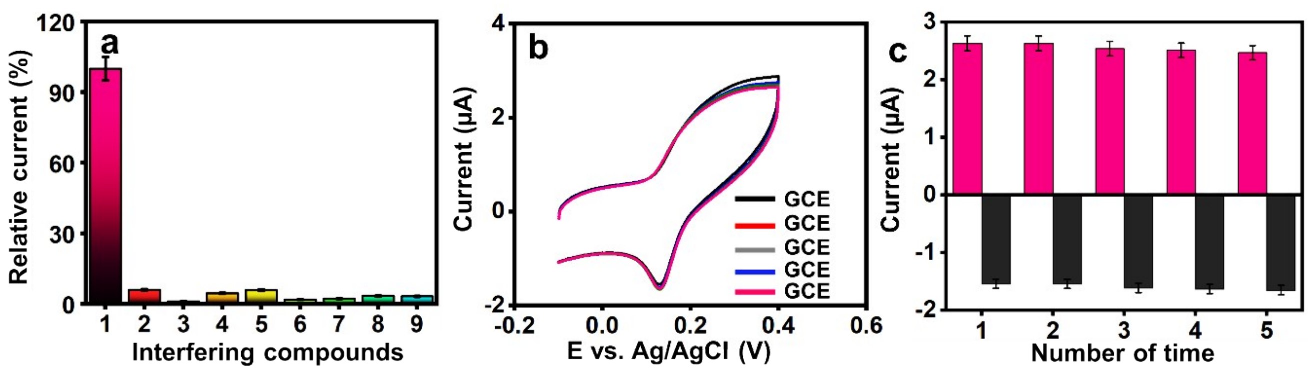

Figure S3. (a) Interference study of various analyte over Trolox. **(b, c)** CV curves for repeatability study towards trolox in electrolyte PB (pH-7.0) and respective bar diagram.

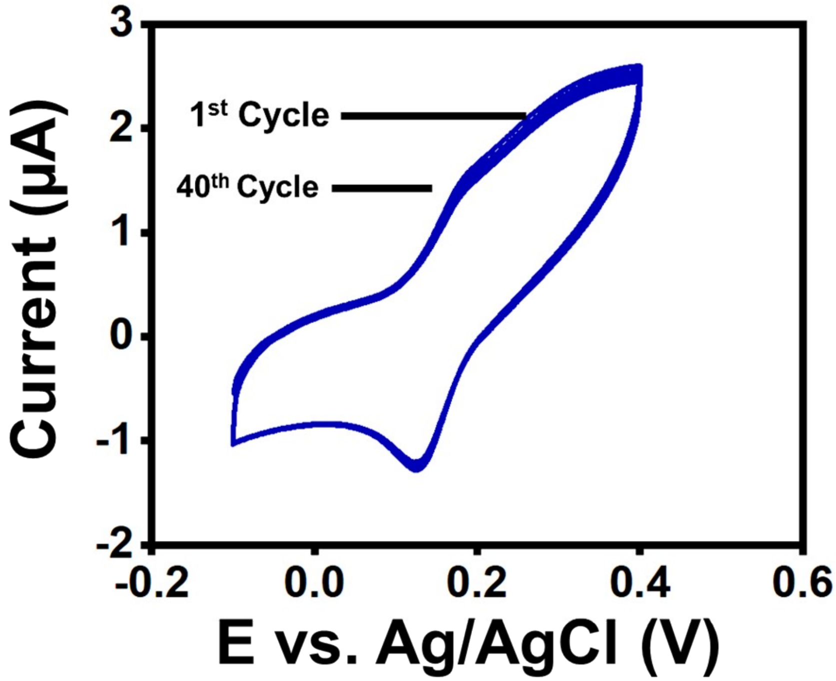

Figure S4. Cycle stability of SnS@f-CNF with the presence of Trolox.

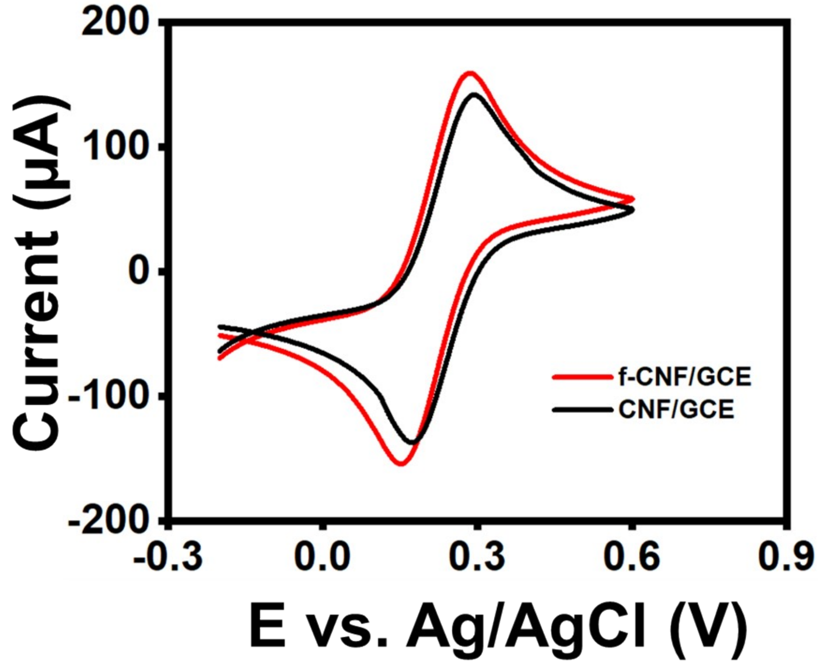

Figure S5. CV scan of f-CNF/GCE and CNF/GCE in redox ferricyanide system.

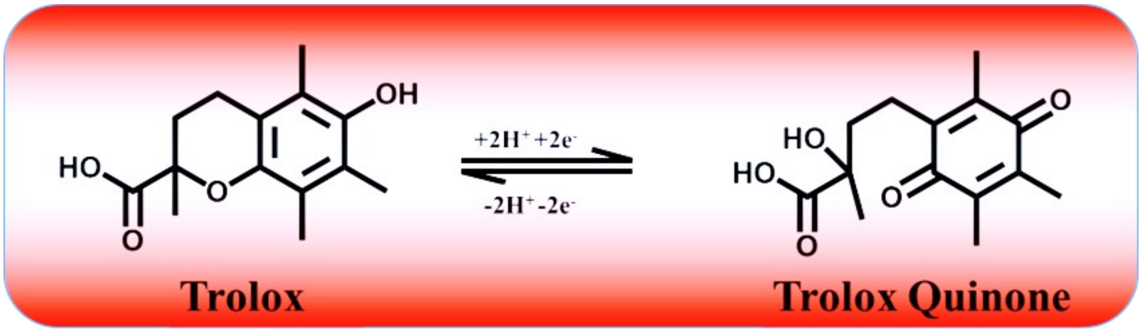

Figure S6. Plausible redox mechanism of Trolox.

Table S1. Summarized Rct values obtained from different modified electrodes.

Electrode	**R_{ct} (Ω.cm^2)**
Bare/GCE	355.48 $\Omega\cdot cm^2$
f-CNF/GCE	332.16 $\Omega\cdot cm^2$
SnS/GCE	167.3 $\Omega\cdot cm^2$
SnS@f-CNF/GCE	52.0 $\Omega\cdot cm^2$

Table S2. Comparison table of the developed sensor's LOD and linear range with previously reported methods for trolox detection.

Material	Method	Linearity	LOD	Reference
Quinary CoNiMgZn-HEO/N-G	Electrochemiluminescence	1 nM - 25 μM	1 nM	S1
PPE and PA-PPE	SWV	5 - 400 μM	1.17 μM	S2
Boron-Doped Diamond Electrode	Amperometry	5 - 160 mg/L	1.4 mg/L	S3
SnS@f-CNF	DPV	5 - 89 μM	0.09 μM	Present work

Table S3. Determination of spiked trolox in using SnS@f-CNF.

Samples	Spiked/μM	Found/μM	Recovery (%) (n=3)	RSD*
Almond oil	0	–	–	–
	5	4.96	99.2	±3.61
	10	9.89	98.9	±1.88
	15	14.85	99.0	±2.54
Sunflower oil	0	–	–	–
	5	4.94	98.8	±1.4
	10	9.92	99.2	±0.46
	15	14.87	99.1	±3.01

References

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S3. T. Arbneshi, A. Frangu, M. Frühbauerová, L. Červenka, L. Berisha, K. Kalcher, and M. Sýs, *Food Technol. Biotechnol.*, 2021, **59(2)**, pp.194-200.