Supporting information for

Green light-responsive photoelectrochemical sensing nanoplatform based on copper cobaltite nanorods for ultrasensitive detection of furazolidone antibiotic residue in food samples

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Content

S1. Supplemental Results and Discussions

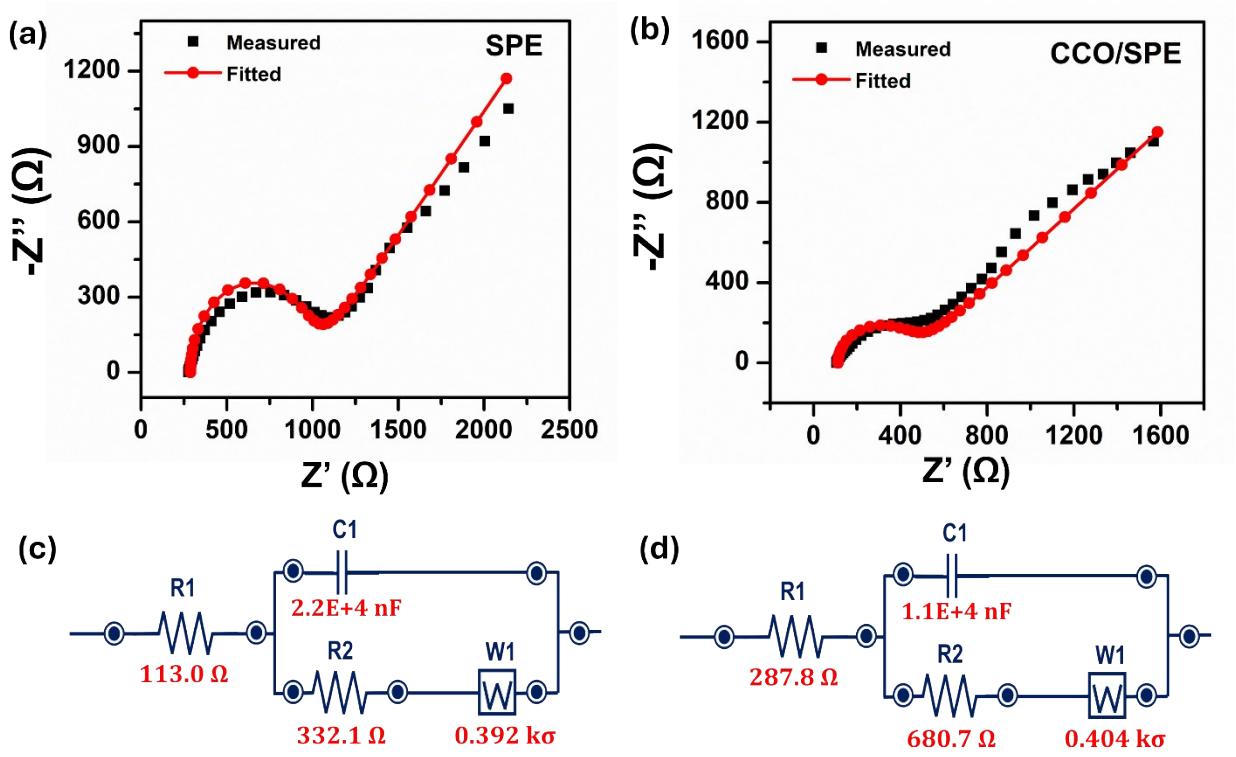

Figure S1. (a - b) Experimental and fitted Nyquist plots of impedance spectra corresponding in the frequency range from 0.01 Hz to 50 kHz of bare SPE, and CCO/SPE. (c -d) The Randles equivalent circuit used for fitting the data.

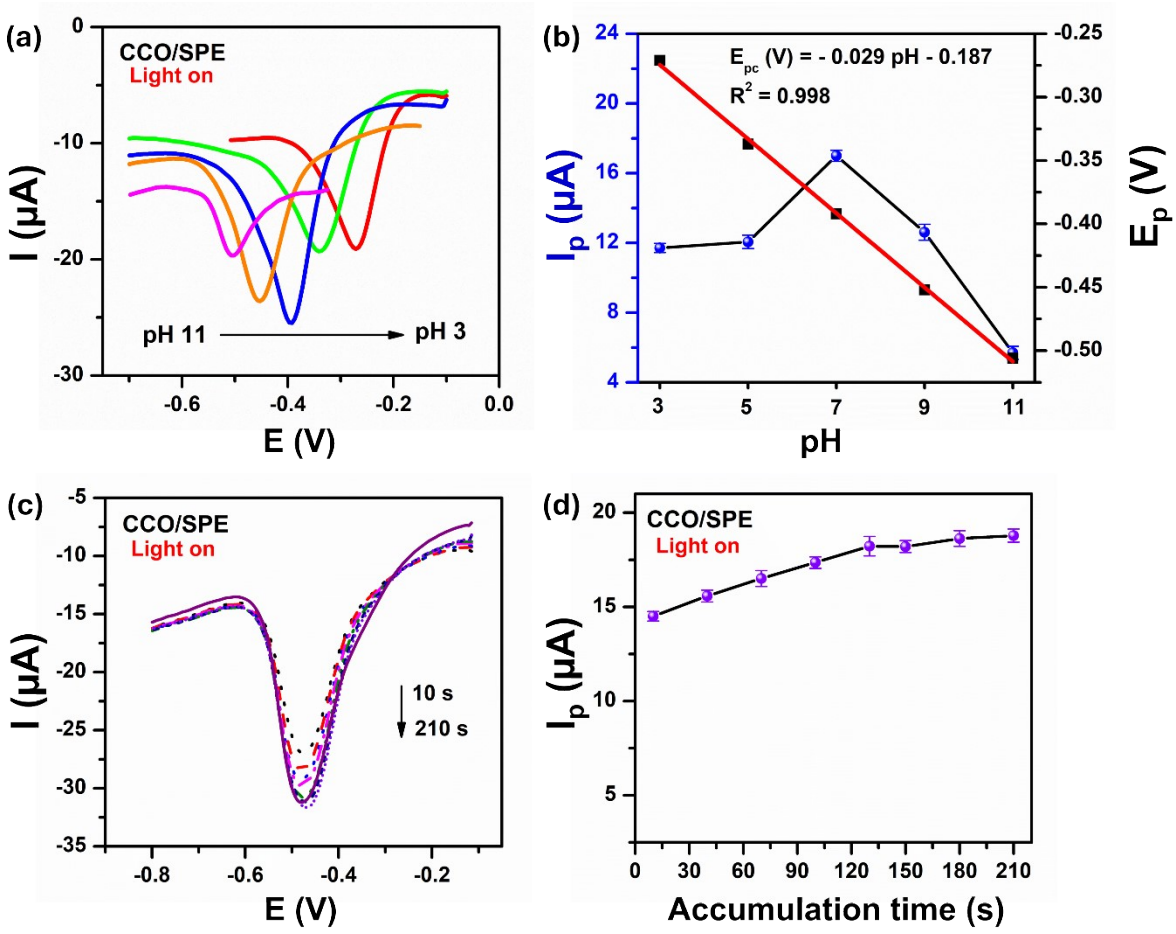

Figure S2. (a) DPV voltammograms of CCO/SPE in 200 μM FZD at different pH values from 3.0 to 11.0; (b) the corresponding calibration plots of electro-reduction peak current and E_{pc} of FZD against pH values with error bars, (c) DPV curves of CCO/SPE in 200 μM FZD at various accumulation time values, and (d) current response with accumulation time values from DPV measurements.

Table S1. A comparison of the electrochemical performance of different modified electrodes toward FZD detection.

Electrode	Technique	Linear range (μM)	LOD (μM)	Sensitivity (μA μM^{-1} cm^{-2})	Real samples	Ref.
$ZnFe_2O_4$/SPE	DPV	0.5 - 75	0.61	0.56	Milk	[1]
ZnO/$ZnFe_2O_4$/SPE	DPV	0.5 - 75	0.41	0.70		
ZnO/$ZnFe_2O_4$/SPE	DPV	1 - 100	0.65	0.76	Pork and shrimp	[2]
GO/SPE	LSV	1 - 100	0.19	1.03	-	[3]
Ag@Fe_3O_4/SPE	DPV	0.5 - 100	0.24	1.36	Honey and milk	[4]
$NiFe_2O_4$/rGO/GCE	DPV	0.1 - 150	0.05	-	Plasma, urine	[5]
$CuCo_2O_4$/SPE (Without green light illumination)	DPV	0.5 - 200	0.09	0.93	-	This work
$CuCo_2O_4$/SPE (With green light illumination)	DPV	0.25 -200	0.03	1.11	Honey and milk	

***LOD**: Limit of detection; **SPE**: Screen-printed electrode; **DPV**: Differential pulse voltammetry; **GO**: Graphene oxide; **LSV**: Linear sweep voltammetry; **rGO**: Reduced graphene oxide; **GCE**: Glassy carbon electrode;*

Reference

1. N. N. Huyen, N. T. Anh, T. L. H. Phung, N. X. Dinh, N. T. Vinh, T. T. Loan, D. L. Vu and A.-T. Le, Boosting the Selective Electrochemical Signals for Simultaneous Determination of Chloramphenicol and Furazolidone in Food Samples by Using $ZnFe_2O_4$-Based Sensing Platform: Correlation between Analyte Molecular Structure and Electronic Property of Electrode Materials, *J. Electrochem. Soc.,* 2022, **169**, 106517.
2. N. T. Anh, N. N. Huyen, N. X. Dinh, N. T. Vinh, N. Van Quy, V. D. Lam and A.-T. Le, $ZnO/ZnFe_2O_4$ nanocomposite-based electrochemical nanosensors for the detection of furazolidone in pork and shrimp samples: exploring the role of crystallinity, phase ratio, and heterojunction formation, *New J.Chem.*, 2022, **46**, 7090-7102.
3. D. T. N. Nga, N. L. N. Trang, V.-T. Hoang, X.-D. Ngo, P. T. Nhung, D. Q. Tri, N. D. Cuong, P. A. Tuan, T. Q. Huy and A.-T. Le, Elucidating the roles of oxygen functional groups and defect density of electrochemically exfoliated GO on the kinetic parameters towards furazolidone detection, *RSC Adv.*, 2022, **12**, 27855-27867.
4. N. T. Anh, N. X. Dinh, N. N. Huyen, P. T. L. Huong, V. N. Phan, P. D. Thang, H. Van Tuan, T. Van Tan and A.-T. Le, Promoting electron transfer kinetics and adsorption capacity for the detection of furazolidone in real food samples by using ag-core@Fe_3O_4-shell-based electrochemical sensing platform, *J. Electrochem.Soc.*, 2023, **170**, 017510.
5. A. A. Ensafi, N. Zandi-Atashbar, M. Gorgabi-Khorzoughi and B. Rezaei, Nickel-ferrite oxide decorated on reduced graphene oxide, an efficient and selective electrochemical sensor for detection of furazolidone, *IEEE Sens. J.*, 2019, **19**, 5396-5403.