

Origami Paper-Based Electrochemical Immunosensor with Carbon Nanohorns-Decorated Nanoporous Gold for Zearalenone Detection

Anabel Laza, Sirley V. Pereira, Germán A. Messina, Martín A. Fernández-Baldo, Julio Raba, Matías D. Regiart and Franco A. Bertolino *

Instituto de Química de San Luis (INQUISAL), Facultad de Química, Bioquímica y Farmacia (FQBF), Universidad Nacional de San Luis (UNSL), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), INQUISAL (UNSL—CONICET), Chacabuco 917, San Luis D5700BWS, Argentina; anabellaza91@gmail.com (A.L.); spereira@unsl.edu.ar (S.V.P.); messina@unsl.edu.ar (G.A.M.); mbaldo@unsl.edu.ar (M.A.F.-B.); jraba@unsl.edu.ar (J.R.); mregiart@unsl.edu.ar (M.D.R.)

* Correspondence: bertolino@unsl.edu.ar

S1. Theoretical model

In order to know the electroactive surface area, the Randles–Sevcik equation was used at scan rate from 20 to 300 mV s^{−1} [1,2].

$$I_p = \pm 2.69 \times 10^5 n^{3/2} D^{1/2} A C v^{1/2}$$

where I_p is the anodic or cathodic peak current, C is the $[\text{Fe}(\text{CN})_6]^{4-}$ concentration in bulk solution (1 mmol L^{−1}). D is the standard diffusion coefficient of $[\text{Fe}(\text{CN})_6]^{4-}$ in solution (7.6×10^{-6} cm² s^{−1} at 0.1 mol L^{−1} KCl), $v^{1/2}$ is the square root of potential scan rate and A is the electroactive surface area (cm²).

S2. XRD spectrum

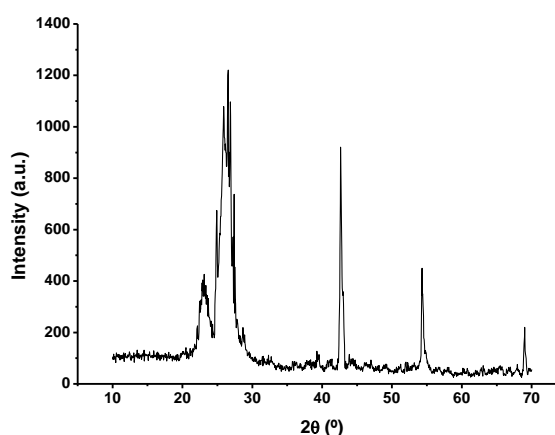


Figure S1. The XRD pattern of the GPE/CNH/GNP crystalline structure.

Citation: Laza, A.; Pereira, S.V.; Messina, G.A.; Fernández-Baldo, M.A.; Raba, J.; Regiart, M.D.; Bertolino, F.A. Origami Paper-Based Electrochemical Immunosensor with Carbon Nanohorns-Decorated Nanoporous Gold for Zearalenone Detection. *Chemosensors* **2024**, *12*, 10. <https://doi.org/10.3390/chemosensors12010010>

Academic Editor: Pedro Salazar

Received: 8 November 2023

Revised: 22 December 2023

Accepted: 29 December 2023

Published: 5 January 2024



Copyright: © 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

References

1. Bard, A.J.; Faulkner, L.R. *Electrochemical Methods: Fundamentals and Applications*, 2nd ed.; John Wiley & Sons, Inc.: Hoboken, NJ, USA, 2000.
2. Laviron E. General expression of the linear potential sweep voltammogram in the case of diffusionless electrochemical systems. *J. Electroanal. Chem. Interfacial Electrochem.* **1979**, *101*, 19–28.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.