

Accepted Manuscript

Title: Reduced graphene oxide-Sb₂O₅ hybrid nanomaterial for the design of a laccase-based amperometric biosensor for estriol

Author: Fernando H. Cincotto Thiago C. Canevari Sergio A.S. Machado Alfredo Sánchez Maria Asunción Ruiz Barrio Reynaldo Villalonga José M. Pingarrón



PII: S0013-4686(15)01370-5
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2015.06.013>
Reference: EA 25138

To appear in: *Electrochimica Acta*

Received date: 26-4-2015
Revised date: 2-6-2015
Accepted date: 2-6-2015

Please cite this article as: Fernando H.Cincotto, Thiago C.Canevari, Sergio A.S.Machado, Alfredo Sánchez, Maria Asunción Ruiz Barrio, Reynaldo Villalonga, José M.Pingarrón, Reduced graphene oxide-Sb₂O₅ hybrid nanomaterial for the design of a laccase-based amperometric biosensor for estriol, *Electrochimica Acta* <http://dx.doi.org/10.1016/j.electacta.2015.06.013>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Reduced graphene oxide-Sb₂O₅ hybrid nanomaterial for the design of a laccase-based amperometric biosensor for estriol

Fernando H. Cincotto,^{a,b} Thiago C. Canevari,^{c*} Sergio A. S. Machado,^b Alfredo Sánchez,^a Maria Asunción Ruiz Barrio,^a Reynaldo Villalonga,^{a*} José M. Pingarrón^{a*}

^aDepartment of Analytical Chemistry, Faculty of Chemistry, Complutense University of Madrid, 28040-Madrid, Spain.

^bInstitute of Chemistry, State University of São Paulo, PO Box 780, 13560-970 São Carlos, SP, Brazil.

^cEngineering School, Mackenzie Presbyterian University, 01302-907 São Paulo, SP, Brazil.

*Corresponding authors: tccanevari@gmail.com, rvillalonga@quim.ucm.es, pingarro@quim.ucm.es

Graphical abstract

Abstract

A novel reduced graphene oxide/Sb₂O₅ hybrid nanomaterial was prepared by a one-pot reaction process. The nanomaterial was characterized by different spectroscopic, microscopic and electrochemical techniques, demonstrating that the graphene sheets were doped with a Sb₂O₅ thin film. A glassy carbon electrode coated with the hybrid material was further employed as support for the covalent immobilization of laccase to develop an electrochemical biosensor for estriol. The enzyme biosensor showed high sensitivity (275 mA/M) and fast analytical response (4 s) for the hormone, with a limit of detection of 11 nM in the range of 25 nM to 1.03 μM. The biosensor showed high selectivity for the analytical detection of estriol.

Download English Version:

<https://daneshyari.com/en/article/6611142>

Download Persian Version:

<https://daneshyari.com/article/6611142>

[Daneshyari.com](https://daneshyari.com)