

## Author's Accepted Manuscript

Electrografting of thionine diazonium cation onto the graphene Edges and Decorating with Au Nano-Dendrites or glucose oxidase: Characterization and electrocatalytic Applications

Reza Karimi Shervedani, Akbar Amini, Nima Sadeghi



PII: S0956-5663(15)30458-9  
DOI: <http://dx.doi.org/10.1016/j.bios.2015.09.062>  
Reference: BIOS8029

To appear in: *Biosensors and Bioelectronic*

Received date: 19 July 2015  
Revised date: 22 September 2015  
Accepted date: 27 September 2015

Cite this article as: Reza Karimi Shervedani, Akbar Amini and Nima Sadeghi Electrografting of thionine diazonium cation onto the graphene Edges and Decorating with Au Nano-Dendrites or glucose oxidase: Characterization and electrocatalytic Applications, *Biosensors and Bioelectronic* <http://dx.doi.org/10.1016/j.bios.2015.09.062>

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 galley proof before it is published in its final citable 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

# Electrografting of Thionine Diazonium Cation onto the Graphene Edges and Decorating with Au Nano-Dendrites or Glucose Oxidase: Characterization and Electrocatalytic Applications

Reza Karimi Shervedani,\* Akbar Amini, Nima Sadeghi

Department of Chemistry, University of Isfahan, Isfahan 81746-73441, I. R. Iran, Corresponding author. Tel.: +98-313-7932715. Fax: +98-313-6689732. E-mail address: rkarimi@sci.ui.ac.ir (R. Karimi Shervedani).

## Abstract

Thionine (Th) diazonium cation is covalently attached onto the glassy carbon (GC) electrode via graphene nanosheets (GNs) (GC-GNs-Th). The GC-GNs-Th electrode is subjected to further modifications to fabricate (i) glucose and (ii) nitrite sensors. Further modifications include: (i) direct immobilization of glucose oxidase (GOx) and (ii) electrodeposition of gold dendrite-like nanostructures (DGNs) on the GC-GNs-Th surface, constructing GC-GNs-Th-GOx and GC-GNs-Th-DGNs modified electrodes, respectively. The GC-GNs-Th-GOx biosensor exhibited a linear response range to glucose, from 0.5 to 6.0 mM, with a limit of detection (LOD) of 9.6  $\mu\text{M}$  and high sensitivity of 43.2  $\mu\text{A cm}^{-2} \text{mM}^{-1}$ . Also, the GC-GNs-Th-DGNs sensor showed a wide dynamic response range for  $\text{NO}_2^-$  ion with two linear parts, from 0.05  $\mu\text{M}$  to 1.0  $\mu\text{M}$  and 30.0  $\mu\text{M}$  to 1.0 mM, a sensitivity of 263.2  $\mu\text{A mM}^{-1}$  and a LOD of 0.01  $\mu\text{M}$ . Applicability of the modified electrodes was successfully tested by determination of glucose in human blood serum and nitrite in water based on addition/recovery tests.

---

\* To whom correspondence should be addressed. Tel.: +98-313-7932715. Fax: +98-313-6689732. E-mail address: rkarimi@sci.ui.ac.ir

Download English Version:

<https://daneshyari.com/en/article/7231560>

Download Persian Version:

<https://daneshyari.com/article/7231560>

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