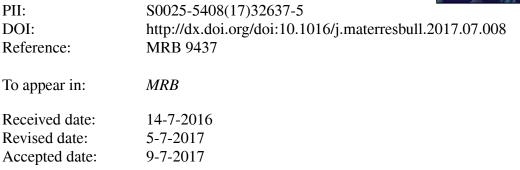
### Accepted Manuscript

Title: Organic-inorganic hybrid matrix for electrochemical biosensing of tyrosine

Authors: Suman Singh, D.V.S. Jain, Vijay Kumar Meena



Please cite this article as: Suman Singh, D.V.S.Jain, Vijay Kumar Meena, Organicinorganic hybrid matrix for electrochemical biosensing of tyrosine, Materials Research Bulletinhttp://dx.doi.org/10.1016/j.materresbull.2017.07.008

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.



## ACCEPTED MANUSCRIPT

#### Organic-inorganic hybrid matrix for electrochemical biosensing of tyrosine

#### Suman Singh<sup>a\*</sup>, D.V.S. Jain<sup>b</sup>, Vijay Kumar Meena<sup>a</sup>

<sup>a</sup>Central Scientific Instruments Organisation (CSIR-CSIO), Chandigarh, India

<sup>b</sup>Panjab University, Chandigarh, India

\*Corresponding author: ssingh@csio.res.in

#### Highlights:

- In-situ electrochemical synthesis of polypyrrole (PPy) and gold nanoparticles (AuNPs) composite has been performed.
- Characterization of the composite has been done.
- Fabricated biosensor using tyrosinase enzyme.
- Performed electrochemical sensing of tyrosine and catechin using SPE/PPy–AuNPs/Tyr biosensor.

#### Abstract

The manuscript presents synthesis and application of organic-inorganic hybrid matrix, consisting of polypyrrole (PPy) and gold nanoparticles (AuNPs). The polypyrrole acts as conducting matrix and gold nanostructures play role of electro-catalysts. The composite of PPy-AuNPs was electrochemically synthesized on screen printed electrodes in single step and was characterized thoroughly using analytical techniques. The composite was used as matrix for immobilization of tyrosinase enzyme for tyrosine and catechin biosensing. The electrochemical measurements were performed using cyclic voltammetry (CV) and amperometry. For tyrosine, the composite based biosensor showed dynamic linearity from 10-100 nM, having sensitivity of  $1.0 \times 10^{-2} \,\mu Acm^{-2}/nM$ , and LOD of 0.3 nM. For catechin, the dynamic linearity range was from 1-20 nM. The study showed that the biosensor exhibited more sensitivity towards tyrosine estimation as compared to

Download English Version:

# https://daneshyari.com/en/article/5442096

Download Persian Version:

https://daneshyari.com/article/5442096

Daneshyari.com