

Accepted Manuscript

Title: Enzymeless PEDOT-based electrochemical sensor for the detection of nitrophenols and organophosphates

Authors: Bruna M. Hryniewicz, Elisa S. Orth, Marcio Vidotti

PII: S0925-4005(17)32076-2
DOI: <https://doi.org/10.1016/j.snb.2017.10.162>
Reference: SNB 23466

To appear in: *Sensors and Actuators B*

Received date: 8-7-2017
Revised date: 24-10-2017
Accepted date: 27-10-2017



Please cite this article as: Bruna M.Hryniewicz, Elisa S.Orth, Marcio Vidotti, Enzymeless PEDOT-based electrochemical sensor for the detection of nitrophenols and organophosphates, Sensors and Actuators B: Chemical <https://doi.org/10.1016/j.snb.2017.10.162>

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.

Enzymeless PEDOT-based electrochemical sensor for the detection of nitrophenols and organophosphates

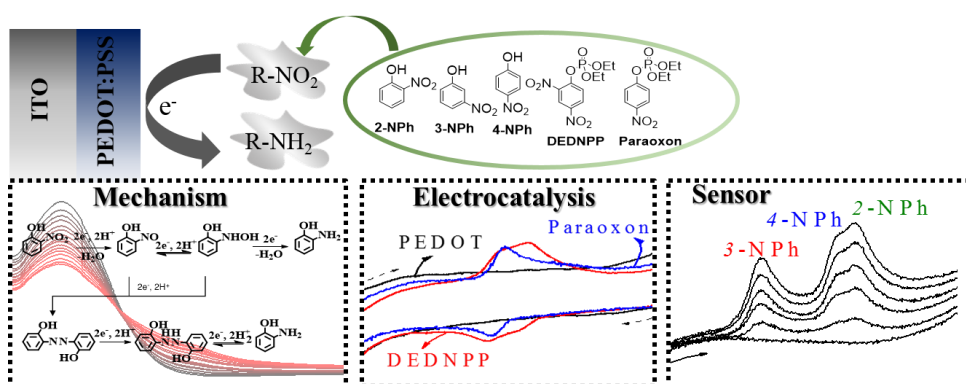
Bruna M. Hryniewicz,^a Elisa S. Orth,^b Marcio Vidotti^{a*}

^a Grupo de Pesquisa em Macromoléculas e Interfaces - Departamento de Química, Universidade Federal do Paraná, C.P. 19032, CEP 81531-980, Curitiba, PR, Brazil.

^b Grupo de Catálise e Cinética - Departamento de Química, Universidade Federal do Paraná, C.P. 19032, CEP 81531-980, Curitiba, PR, Brazil.

*Corresponding author: mvidotti@ufpr.br

GRAPHICAL ABSTRACT



Highlights

- Enzymeless detection of nitrophenol isomers based on PEDOT:PSS modified electrodes;
- Direct electrochemical detection of DEDNPP and Paraoxon pollutants;
- Mechanistic studies of electrocatalytic reactions of nitrophenols;

Abstract

PEDOT:PSS modified electrodes were prepared via one-step electropolymerization and employed as electrochemical sensor for the detection of nitrophenols and organophosphorus compounds. The electrocatalytic behavior of PEDOT towards the redox reactions of the nitrophenol isomers were studied by electrochemical and spectroscopy techniques and a detection mechanism is proposed. The detection of the isomers was possible by the analysis of the oxidation peaks of the intermediates generated by the direct reduction of the nitro groups and the analytical performance was evaluated in terms of the individual analysis of each isomer and in a multi-component solution. It was found that the simultaneous detection of the isomers is feasible, although the quantification is only possible of 3- and 4-NPh in the multi-component sample. In addition, hazardous organophosphate pollutants such as diethyl 2,4-dinitrophenyl phosphate (DEDNPP) and diethyl 4-nitrophenyl phosphate (Paraoxon) were also detected by the study of the electrochemical reduction of the nitro groups presented and as observed by the nitrophenol molecules and some analytical parameters

Download English Version:

<https://daneshyari.com/en/article/7141451>

Download Persian Version:

<https://daneshyari.com/article/7141451>

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