CYCLIC VOLTAMMETRY STUDIES OF BIOTOXINS ON NANOSTRUTURED SCREEN PRINTED ELECTRODES

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Introduction

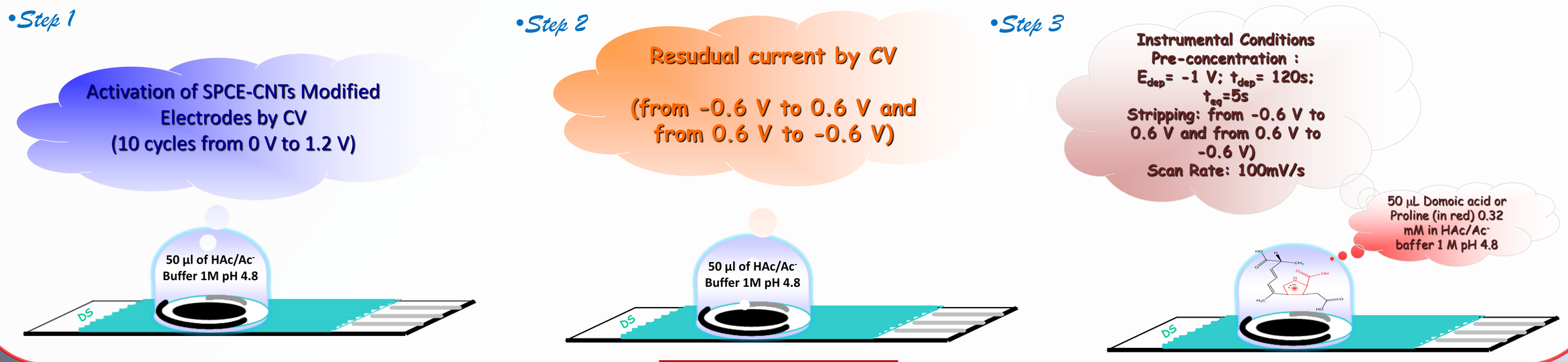
The methods of analysis recognized for the detection of biotoxins marine in bivalve live molluscs have been modified by the European Commission 15/2011 in January 10 (2011) substituting the Regulation (CE) n º 2074/2005. Concurrently, bioassay's method in mice will not be able to continue used after December 31, 2014, for what it will be necessary that the different laboratories that nowadays carry out these biotoxin analyses, should equip adequately to be able to realize the pertinent controls.

in this context, it will be necessary to develop sensitive/selective/cheap methods of analysis with robust instruments to obtain the indispensable requirements to be able to carry out the determination of the marine biotoxins with lower limits of detection (LOD) and to validate them with the standard AOAC method based on high performance liquid chromatography (HPLC)(Gago-Martinez et al., Chromatographia, 53 (2001) S231-S235).

With this aim, we present the preliminary results of our work on the development of an electrochemical sensor based on the direct interaction between domoic acid (DA)/ proline and a "Screen Printed" Carbon Electrode (SPCE) modified with multi-walled carbon nanotubes (MWCNTs) with acidic (-COOH) functionalities.

The methodology in this study will be extending to other ones biotoxins and to different types of nanostructured electrode surface upon incorporation of other nanomaterials and nanostructures (NPs).

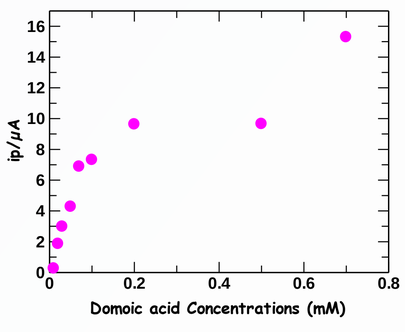
Experimental

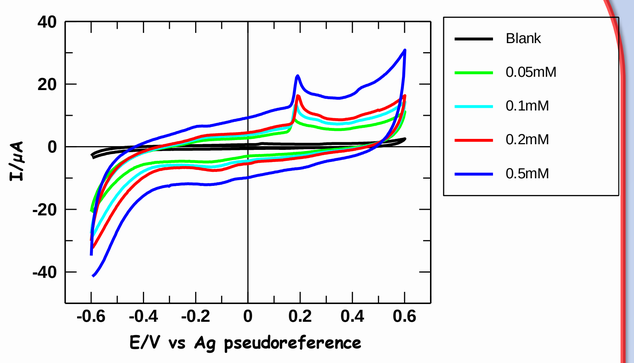


Results

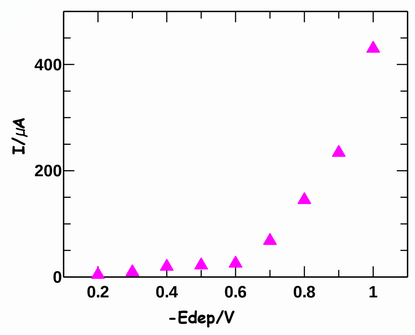
DOMOIC ACID (AD)

Calibration curve and cyclic voltammograms of DA/MWCNTs electrode in HAc/Ac⁻ 1M, pH 4.8

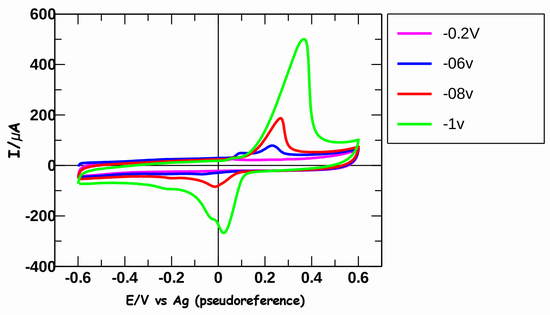




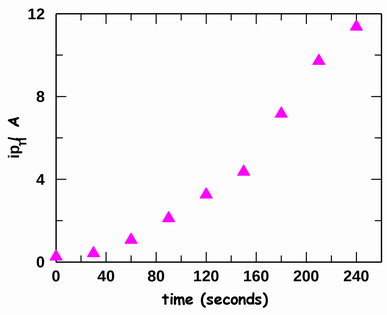
Relationship between i_{pa} and deposition potential



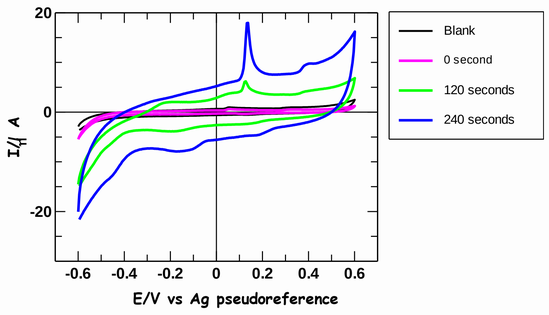
Cyclic voltammograms depend on deposition potential



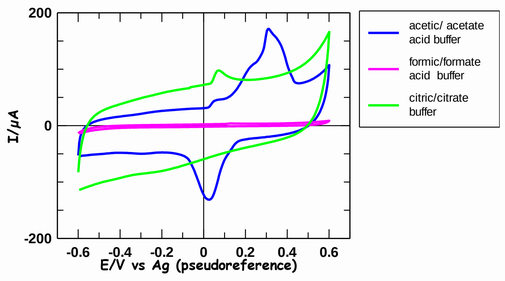
Relationship between i_{pa} and time variation



Cyclic voltammograms of DA depend on time

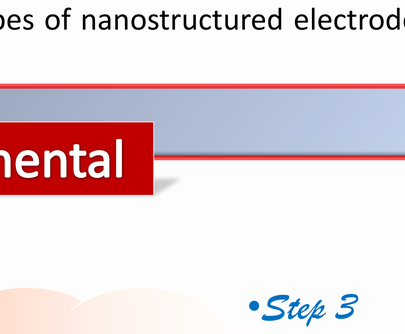


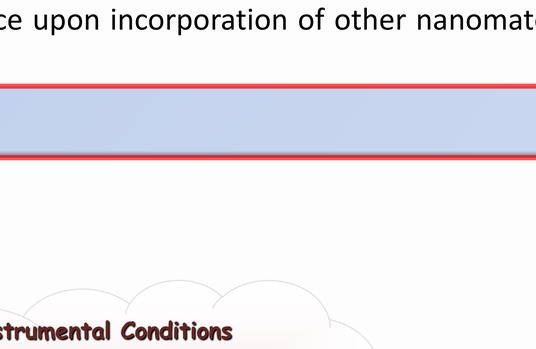
Response of DA in several buffers



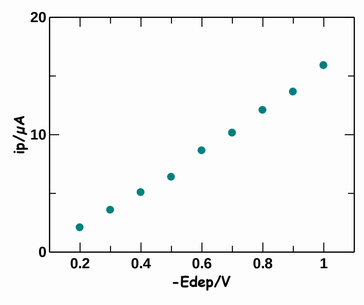
PROLINE

Calibration curve and cyclic voltammograms of proline /MWCNTs electrode in HAc/Ac⁻ 1M, pH 4.8

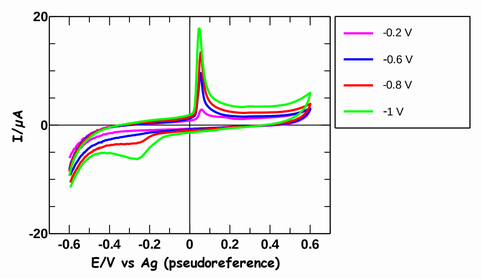




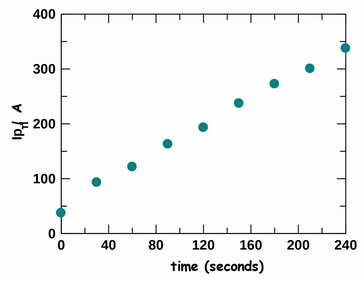
Relationship between i_{pa} and deposition potential



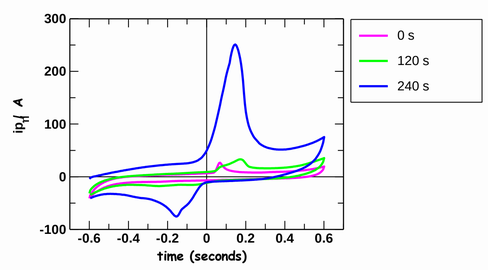
Cyclic voltammograms depend on deposition potential



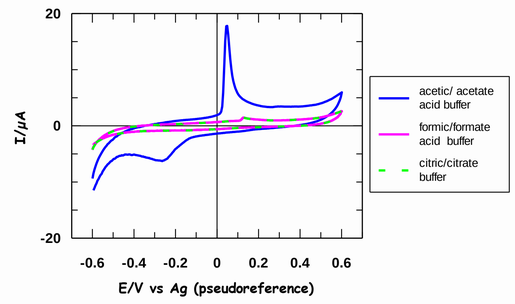
Relationship between i_{pa} and time variation



Cyclic voltammograms of proline depend on time



Response of proline in several buffers



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