

EPINEPHRINE DETECTION IN COPPER SELF ASSEMBLED MONOLAYERS

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The electrocatalytic activity of surface-confined copper 1,10 phenanthrolines is well known (1). The possibility to have a copper complex in a rigid system by two phenanthrolines suggests the possibility that the reactivity of the complex will be increased (1).

The copper like functionalized agent at the nanoarray present interesting properties since it is an important redox center at biological level, which is present in enzymes (like the copper superoxide dismutase and catechol oxidase, for example) (2).

This research makes the construction and characterization of organic monolayers two copper phenanthrolines (see Figure 1), which will be characterized by cyclic voltammetry, XPS and STM.

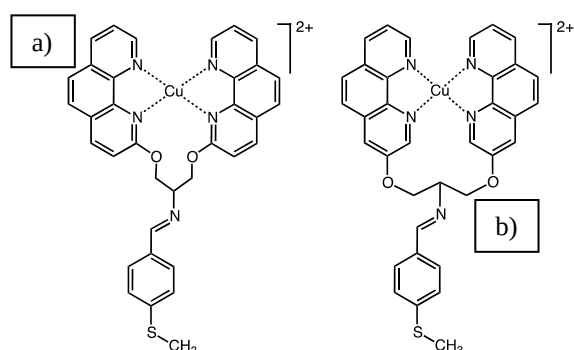


Figure 1. a) 1,3-bis((1,10-phenanthroline-2-yl)oxy)-N-(4-(methylthio)benzylidene)propan-2-amine. b) 1,3-bis((1,10-phenanthroline-3-yl)oxy)-N-(4-(methylthio)benzylidene)propan-2-amine, (L2)

Our results showed the formation of copper phenanthrolines monolayers with a high packing (see Figure 2). The electrochemical measures of desorption potential of S-Au binding could estimate the contents of complex present in the surface, and to characterize the redox process of copper.

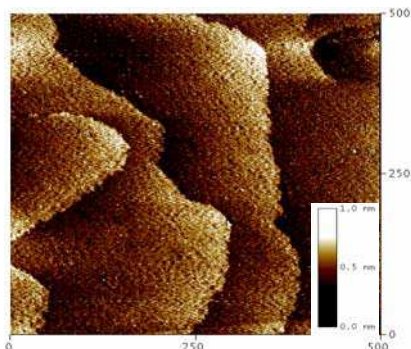


Figure 2. STM image of 1,3-bis((1,10-phenanthroline-2-yl)oxy)-N-(4-(methylthio)benzylidene)propan-2-amine.

We studied the epinephrine detection determining electrocatalytic advantages of these systems compared to copper phthalocyanines axially linked organic monolayers.

The Cu improves the selectivity of the sensor substantially, and this is evaluated with regard to the information reported in literature and the system without functionalization. The sensitivity and selectivity for the oxidation of epinephrine and ascorbic acid is also evaluated considering response of the systems after formation of arrangements, the systems show a favorable response that is dependent on the concentration of analyte against epinephrine and serotonin. Both systems have no response to ascorbic acid. Compared with the response of other carbon electrodes (3) the systems were proposed to be selective against the detection of neurotransmitter.

Acknowledgements: This work has been funded by Fondecyt 11100450. L.L. also thanks at Fondecyt for postdoctoral fellowship.

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