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MULTIWALLED CARBON NANOTUBE-$CaCO_3$ NANOPARTICLE COMPOSITES FOR THE CONSTRUCTION OF AMPEROMETRIC BIOSENSORS

M.-R. Bujduveanu,[1] R. Mandoc,[1] G.-O. Buica,[1] E.-M. Ungureanu,[1]
A. Le Goff,[2] M. Holzinger,[2] K. Gorgy,[2] S. Cosnier,[2] Wenjuan Yao,[3] Dan Shan,[3]
Guo-Wang Diao[3]

[1] Faculté de Chimie Apliquée et Science des Matériaux, Université "Politehnica" de Bucarest, 1-7 Gheorghe Polizu, 011061, Bucarest, Roumanie
[2]Departament de Chimie Moleculaire, Chimie Inorganique REdox - CIRE, Université Joseph Fourier - Grenoble 1, UFR de Chimie, Bâtiment C, BP 53, 38041 Grenoble cedex 9
[3]School of Chemistry & Chemical Engineering, Yangzhou University, Yangzhou 225002, P. R. China

Biosensors are formed by immobilization of biological molecules on transducers. They are of great importance in **medical diagnostics and environmental monitoring**. An interesting approach is the immobilization of biological molecules in a **friendly $CaCO_3$ matrix**[1, 2]. The aim of this work was to combine $CaCO_3$ and carbon nanotubes (CNTs) in order to **amplify the electrochemical transduction** phenomenon. CNTs have a high specific conductive surface which can provide high biomolecule loading and enhanced electrochemical properties making it a material of choice for the biosensor building[3, 4].

We performed the immobilization of **polyphenol oxidase** (PPO) that allows the oxidation of catechol in ortho-quinone and allowed the amperometric detection of catechol in aqueous solution (pH 6) at -0.2V vs. SCE (ortho-quinone reduction); CNT/$CaCO_3$/PPO electrode increases the sensitivity and detection limit in comparison with GC/$CaCO_3$/PPO electrode. After the successful detection of catechol we performed the detection of neurotransmitters such as dopamine (used in anxiety prevention in the medical field) with the system CNT/$CaCO_3$/PPO.[5] Permeability improvements of electropolymerized polypyrrole films were obtained by using dissolvable nano-$CaCO_3$ particle templates.[6]

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