Nanostructured Carbon Forms for Biosensor Applications

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Abstract

This presentation summarizes recent studies on the electrocatalytic behaviour of carbon nanomaterials (CNM) such as carbon nanotubes (CNT) and carbon nanofibers (CNF) and at the same time to show the development of new designs of electrochemical sensors making use of several electrode surfaces modications procedures with interest for future biosensing applications. Several alternatives for CNMs integration into electrochemical biosensing systems have been developed. These are based on modifications of electrode surfaces with CNTs, CNF or in the use of CNT based epoxy composites. For comparison purposes the CNM modified electrodes have been compared with electrodes modified/prepared with carbon microparticles (CMP).

Keywords: Carbon nanotubes, carbon nanofibers, carbon microparticles, composite, modified electrodes, biosensors.

Carbon nanomaterials represent a novel alternative for biosensor development. Due to unique characteristics, such as high surface area, ability to accumulate analyte, minimization of surface fouling and electrocatalytic activity, carbon nanomaterials are used as catalytic support materials and they had shown very attractive properties for electrochemical biosensing systems. The principal reasons for different “electrocatalytic” properties of carbon nanomaterials on different substrates toward different analytes are still unclear and are under investigation. A possible explanation of such an effect beside the carboxylic groups and the possible metal impurities is the different contact resistances of carbon materials with the electrode surfaces.

Acknowledgements

The WARMER Project Reference: FP6-034472-2005-IST-5 and MAT2008-03079/NAN (From MEC, Madrid) are acknowledged.

References

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