Journal Menu

- Abstracting and Indexing
- Aims and Scope
- Article Processing Charges
- Articles in Press
- Author Guidelines
- Bibliographic Information
- Contact Information
- Editorial Board
- Editorial Workflow
- Reviewers Acknowledgment
- Subscription Information

- Open Special Issues
- Published Special Issues
- Special Issue Guidelines

Call for Proposals for Special Issues

Journal of Sensors
Volume 2009 (2009), Article ID 842575, 13 pages
doi:10.1155/2009/842575

Review Article

Nanotechnology: A Tool for Improved Performance on Electrochemical Screen-Printed (Bio)Sensors

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Received 23 December 2008; Accepted 26 March 2009

Academic Editor: Wojtek Wlodarski

Abstract
Full-Text PDF
Full-Text HTML
Linked References
How to Cite this Article
Complete Special Issue

Abstract

Screen-printing technology is a low-cost process, widely used in electronics production, especially in the fabrication of disposable electrodes for (bio)sensor applications. The pastes used for deposition of the successive layers are based on a polymeric binder with metallic dispersions or graphite, and can also contain functional materials such as cofactors, stabilizers and mediators. More recently metal nanoparticles, nanowires and carbon nanotubes have also been included either in these pastes or as a later stage on the working electrode. This review will summarize the use of nanomaterials to improve the electrochemical sensing capability of screen-printed sensors. It will cover mainly disposable sensors and biosensors for biomedical interest and toxicity monitoring, compiling recent examples where several types of metallic and carbon-based nanostructures are responsible for enhancing the performance of these devices.