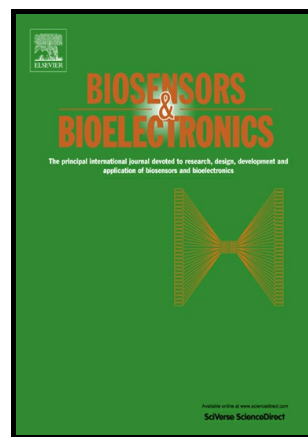


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Rapid, Sensitive, and Reusable Detection of Glucose by Highly Monodisperse Nickel nanoparticles decorated functionalized multi-walled carbon nanotubes

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Abstract

Addressed herein, functionalized multi-walled carbon nanotube (MWCNT) supported highly monodisperse nickel nanoparticles modified on glassy carbon electrode (Ni@*f*-MWCNT/GCE) were synthesized through microwave assisted method and examined for non-enzymatic glucose sensing in ionic liquids by cyclic voltammetry and chronoamperometry. The results of Ni@*f*-MWCNT/GCE electrode were compared with Ni NPs/GCE electrode and the results revealed that *f*-MWCNTs increased the electrocatalytic properties of Ni nanoparticles regarding glucose oxidation. They also demonstrated a good linear span of 0.05 to 12.0 mM and a detection boundary of 0.021 µM. Specifically, in the amperometric signal of the electrodes after 200th cycles, no major change was observed. This non-enzymatic glucose sensor presents one of the record electrocatalytic activity, stability and response towards glucose under the optimized situations. As a result, prepared novel Ni@*f*-MWCNT/GCE was utilized to detect glucose in real serum species.

Keywords: Glucose Detection; Microwave; Nanosensor; Ni@*f*-MWCNT

1. Introduction

¹These authors equally contributed to this work.

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