

Electrochemical Biosensor for Rutin Detection with Multiwall Carbon Nanotubes and Cerium Dioxide Nanoparticles

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Abstract : A new enzymatic electrochemical biosensor based on multiwall carbon nanotubes and cerium oxide nanoparticles for the detection of rutin has been developed. The cerium oxide nanoparticles /HRP/ multiwall carbon nanotubes/ carbon paste electrode (HRP/ CeO₂/MWCNTs/CPE) was prepared by ensuing addition of MWCNTs and HRP on the CPE, followed by the mixing with cerium oxide nanoparticles. Surface physical characteristics of the modified electrode and the electrochemical properties of the composite were investigated by scanning electron microscopy (SEM), transmission electron microscopy (TEM), cyclic voltammetry (CV), differential pulse voltammetry (DPV) and square wave voltammetry (SWV). The HRP/ CeO₂/MWCNTs/CPE showed good selectivity, stability and reproducibility, which was further applied to detect rutin tablet and capsule samples with satisfactory results.

Keywords : cerium dioxide nanoparticles, horseradish peroxidase, multiwall carbon nanotubes, rutin

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