

Electrochemical Determination of Rutin in Herbal Samples Using CuO/CNT composite Modified Glassy Carbon Electrode

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The goal of this research was to create a nanocomposite based on CuO nanoparticles and functionalized CNTs for modification of the glassy carbon electrode (CuO@f-CNTs/GCE) and utilize it as an electrochemical sensor to detect rutin in *Cinnamomum camphora* (L.) J. Presl leaves. CuO@f-CNTs nanocomposite consisting of f-CNTs with CuO nanoparticles in a spherical shape that have developed in tiny sizes and irregular forms, as determined by the surface morphology and crystal structure of modified electrodes using SEM and XRD. The electrochemical properties of CuO@f-CNTs/GCE were investigated using DPV analysis, which revealed a selective and sensitive electrochemical response to rutin determination, with a linear range of 10 to 200 μM and a sensitivity of $0.06087 \mu\text{A}/\mu\text{M}$ and a detection limit of 11 nM. The validity and capability of the developed method for determining rutin content in a prepared real sample of *Cinnamomum camphora* (L.) J. Presl were investigated, and the results showed that the recovery and RSD values by the standard addition method were 99.13% to 99.56% and 2.21% to 4.03%, respectively, indicating that the proposed system had a high detection accuracy and was valid for rutin determination in real herbal samples.

Keywords: Electrochemical Sensor; CuO@f-CNTs nanocomposite; Functionalized CNTs; Rutin; *Cinnamomum camphora* (L.) J. Presl

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