Detection of Neurotransmitter (Levodopa) in Vegetables Using Nitrogen-Doped Graphene Oxide Incorporated Nickel Oxide Modified Electrode

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doi: 10.20964/2018.07.700

Received: 23 March 2018 / Accepted: 7 May 2018 / Published: 5 June 2018

Nitrogen-doped graphene supported with Nickel oxide (N-GE/NiO) nanocomposite were prepared to develop the sensor for determination of L-dopa. The structure and morphology of the N-GE/NiO nanocomposite was characterized by powder X-ray diffraction (PXRD), Fourier transform Infra-red (FT-IR), Raman spectroscopy, thermogravimetric analysis (TGA), field emission scanning electron microscopy (FE-SEM), transmission electron microscopy (TEM) and the electrochemical response of L-dopa was also studied by cyclic voltammetry (CV) and differential pulse voltammetry (DPV) in phosphate buffer solution (PBS) at pH 7.0. The experimental results recommended that N-GE/NiO nanocomposite electro-oxidation response is greater than that of the bare electrode. The DPV results reports of L-dopa were increased linearly in the range from 0.03 – 386.8 μ M with a limit of detection is about 17 nM. Finally, the proposed sensor was applied for the sensitive determination of L-dopa in the vegetable sample and the achieved results were relatively promising.

Keywords: Graphene oxide, Nickel oxide, L-dopa, cyclic voltammetry, sweet potato.

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