4-nitrophenol Detection in Water Sample Using Linear Sweep Voltammetry with *f*-Multi Walled Carbon Nanotubes modified electrode

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In this era, we report active carbon source (*f*-MWCNTs) with more electrode active surface area (EASA). The EASA is a significant role in batteries, supercapacitors and sensor application. Herein, we proposed modified electrode (GCE/*f*-MWCNTs) in the application of a sensor for the detection of 4-NP. The structural defects and morphological analysis were characterized by Raman spectroscopy and transmission electron microscopy (TEM), respectively. Moreover, the electron transfer properties of the modified electrode (GCE/*f*-MWCNTs) were analyzed by using Electrochemical Impedance Spectroscopy (EIS). The electrochemical sensor was developed based on prepared *f*-MWCNTs on a glassy carbon electrode (GCE). The electrocatalytic activity of (GCE/*f*-MWCNTs) modified electrode evaluated by the determination of 4-NP on cyclic voltammetry (CV) and linear sweep voltammetry (LSV). The proposed sensor exhibited good electrocatalytic activity towards the determination 4-NP in a water sample. In addition, the real sample analysis was carried out in laboratory tap water and obtained an acceptable recovery rate (97%), respectively.

Keywords: 4-nitrophenol, *f*-MWCNT, electrochemical determination, water sample

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