Fabrication of Amplified Nanostructure Based Sensor for Analysis of *N*-Acetylcysteine in Presence of High Concentration Folic Acid

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doi: 10.20964/2017.09.34

Received: 31 May 2017 / Accepted: 4 July 2017 / Published: 13 August 2017

A high selective sensor based on carbon paste electrode chemically modified with MgO nanoparticles (MgO/NPs) and acetylferrocene (AF) was used for the simultaneous determination of *N*-acetylcysteine (NAC) and folic acid (FA) in aqueous solution. Electrochemical methods such as cyclic voltammetry (CV), chronoamperometry (CHA), and differential pulse voltammetry (DPV) were used to study the ability of proposed sensor for the electrocatalytic oxidation of NAC. On the best condition in voltammetric analysis, the DPV peak current of NAC increased linearly with its concentration in the ranges of 0.005–0.5 $\mu\text{mol L}^{-1}$ and 1.0–50.0 $\mu\text{mol L}^{-1}$. The detection limit ($S/N = 3$) was 1.0 nmol L^{-1} for NAC. The prepared sensor exhibits good resolution between NAC and FA signals for simultaneous determination of these compounds.

Keywords: Electrocatalysis, Chemically modified electrodes, Folic acid, Carbon paste electrode, MgO nanoparticle, *N*-acetylcysteine

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