



Method Development for Determination of Carbofuran Using Graphene Oxide and Gold Nanoparticles Modified on Screen-Printed Carbon Electrode

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Carbofuran is one of toxic carbamate pesticides. It can be hydrolyzed in basic condition at high temperature to be carbofuran phenol which can be detected by electrochemical techniques. Screen-printed carbon electrodes (SPCEs) were in-house fabricated and then modified with graphene oxide (GO) and gold nanoparticles (AuNPs). GO synthesized by Hummer's method was characterized by ATR-FTIR. The reduction of chloroauric acid was performed in sodium citrate to generate AuNPs solution that was proved by UV-vis spectrometry. The GO/AuNPs-modified SPCE was characterized by SEM. The diffusion-controlled redox process of carbofuran on the modified electrode was examined. Furthermore, the modified electrode was successfully applied to determine carbofuran phenol by differential pulse voltammetry (DPV). The linear range was 1-250 μM with detection limit of 0.22 μM under a suitable condition of 0.1 M phosphate buffer, pH 7.4.

Keywords: Carbofuran; Graphene oxide; Gold nanoparticles