

Poly (Diphenylamine-4-Sulfonic Acid) Modified Glassy Carbon Electrode for Voltammetric Determination of Gallic Acid in Honey and Peanut Samples

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Abstract : In this study, a sensitive and selective voltammetric method based on poly(diphenylamine-4-sulfonic acid) modified glassy carbon electrode (poly(DPASA)/GCE) was developed for determination of gallic acid. Appearance of an irreversible oxidative peak at both bare GCE and poly(DPASA)/GCE for gallic acid with about three folds current enhancement and much reduced potential at poly(DPASA)/GCE showed catalytic property of the modifier towards oxidation of gallic acid. Under optimized conditions, Adsorptive stripping square wave voltammetric peak current response of the poly(DPASA)/GCE showed linear dependence with gallic acid concentration in the range $5.00 \times 10^{-7} - 3.00 \times 10^{-4}$ mol L⁻¹ with limit of detection of 4.35×10^{-9} . Spike recovery results between 94.62-99.63, 95.00-99.80 and 97.25-103.20% of gallic acid in honey, raw peanut, and commercial peanut butter samples respectively, interference recovery results with less than 4.11% error in the presence of uric acid and ascorbic acid, lower LOD and relatively wider dynamic range than most of the previously reported methods validated the potential applicability of the method based on poly(DPASA)/GCE for determination of gallic acid real samples including in honey and peanut samples.

Keywords : gallic acid, diphenyl amine sulfonic acid, adsorptive anodic stripping square wave voltammetry, honey, peanut

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