Short Communication

A Novel Electrochemical Sensor for the Determination of Aflatoxin B₁ Based on Polymerized 4-Amino-7-azaindole-Nitrogen-Doped Graphene

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In this study, nitrogen-doped reduced graphene oxide (N-r-GO) was oxidized by HNO₃ to obtain porous nitrogen-doped reduced graphene oxide (P-N-r-GO). Then, it was used to drop onto the glassy carbon electrode (GCE) surface. Afterward, the above-mentioned GCE was soaked in electrolyte containing tetrabutylammonium perchlorate and 4-Amino-7-azaindole (4-NH₂-7-AIH), and carried out cyclic voltammetry on the surface of P-N-r-GO and its amino group was covalently bound to the carboxyl group of AFB₁ antibody (Anti-AFB₁). Electrochemical impedance spectroscopy (EIS) was used to monitor the electro-catalytic behavior of the modified electrodes. Under the optimized conditions, the impedance increment was linearly related to the AFB₁ concentration in the range of 0.025-30 ng mL⁻¹ with a detection limit of 0.006 ng mL⁻¹.

Keywords: Aflatoxin; Electrochemical immunosensor; Nitrogen-doped reduced graphene oxide; Conductive polymers

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