Electropolymerized Molecular Imprinting & Graphene Modified Electrode for Detection of Melamine

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doi: 10.20964/2017.12.34

Received: 30 July 2017 / Accepted: 19 October 2017 / Published: 12 November 2017

A new method for the determination of melamine (MEL) indirectly by the changes of differential pulse voltammetry (DPV) current of $K_3[Fe(CN)_6]$ probes after 10 min incubation (ΔI) has been established. It's based on the inhibitory effect of MEL on occupying the molecular recognition sites of surface of the electropolymerized molecular imprinting & graphene modified glassy carbon electrode (MIPPy/GR/GCE). The MIPPy/GR/GCE was characterized by cyclic voltammetry (CV), electrochemical impedance spectrometry (EIS) and scanning electron microscopy (SEM). The ΔI is linearly proportional to the negative logarithmic concentration of MEL over the range of $3.0 \times 10^{-8} \sim 1.0 \times 10^{-4} \text{ mol} \cdot \text{L}^{-1}$ ($R = 0.9948$), the detection limit is $1.02 \times 10^{-8} \text{ mol} \cdot \text{L}^{-1}$ ($S/N = 3$). The recoveries of samples are from 102.65% to 108.02%, the result is satisfactory when it is used to analyze the real samples.

Keywords: Molecularly imprinted polymer; Graphene; Melamine; Sensor

FULL TEXT

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