Electrochemical Determination of Rutin Using SnO₂/nitrogen-doped Graphene Composite Electrode

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Herein, the nanocomposites of SnO₂ nanoparticles on the nitrogen-doped graphene (SnO₂/NG) as a sensitive electrochemical sensing platform for rutin determination were easily prepared via a facile hydrothermal method. The results showed that the existence of NG in SnO₂/NG composites could dramatically improve the conductivity, facilitate the electron transfer and enhance the electro-catalytic activity of rutin. Compared with pure SnO₂, NG and SnO₂/graphene, the as-prepared SnO₂/NG nanocomposite presented improved electrocatalytic activity for the oxidation of rutin due to the synergetic effects from SnO₂ and NG. Combined with differential pulse voltammetry, the prepared sensor based on SnO₂/NG modified electrode displayed a wide linear range from 0.4 nM to 2 μM with a detection limit of 0.2 nM. The modified electrode exhibited high stability and reproducibility as well as good selectivity. These results suggest that SnO₂/NG could be successfully applied for detecting rutin in practical samples.

Keywords: SnO₂ nanoparticles; Nitrogen-doped graphene; rutin; Electrochemical determination

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