Highly Sensitive Determination of Theophylline Based on Graphene Quantum Dots Modified Electrode

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In this study we introduce a novel modification for the surface of screen-printed electrode (SPE) by graphene quantum dot (GQD) in order to be used in the determination and detection of theophylline. An uncomplicated technique was employed to stabilize GQD on screen-printed electrode. Function evaluation of the GQD modified SPE (GQD/SPE) by cyclic voltammetry revealed enhanced electroactivity in the oxidation of theophylline in buffer solution of phosphate. Differential-pulse voltammetry (DPV), cyclic voltammetry (CV) and chronoamperometry were applied to determine the sensitivity of GQD/SPE toward detection of theophylline. A wide linear concentration range of 1.0–700.0 μM and detection limit of 0.2 μM ($S/N = 3$) obtained under optimized conditions. This sensor was successful in the assessment of theophylline in real samples.

Keywords: Theophylline, Graphite screen-printed electrode, Graphene quantum dots, Modified electrode

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