

ABSTRACT

Methods for the determination of five isomers of aminonitrophenol were developed, based on the technique of differential pulse voltammetry (DPV) and HPLC with amperometric detection. As the working electrodes, boron-doped diamond film electrode (BDDFE) and glassy carbon paste electrode (GCPE) were employed. Preliminary electrode testing was performed by cyclic voltammetry. The methods were aimed to the determination of all five aminonitrophenol isomers in hair dyes and to the determination of 2-amino-4-nitrophenol and 4-amino-2-nitrophenol in body fluids after solid phase extraction. From the voltammetric methods, the one using BDDFE for the cathodic determination in hair dyes exhibits sufficient selectivity. The performance of chromatographic methods was found suitable for the determination of aminonitrophenols in both observed matrices. The applicability of the developed methods was successfully confirmed by the determination of tested analytes in real samples of hair dyes and spiked samples of urine.

Preceding measurements are described, dealing with the determination of other oxidizable compounds, containing phenolic or aniline moieties on BDDFE. The obtained results confirm that in some cases, BDDFE shows more resistance to fouling than other carbon-based electrodes, but in most cases, the passivation of the electrode is observable. The cleaning and activating procedure, consisting of application of high anodic and cathodic potentials in acidic medium, was used successfully; in the flow arrangement, the fouling can also be overcome by application of higher flow rate.