

Abstract

The aim of this study was the finding of applicable conditions for the determination of selected model environmental pollutants, namely 5-nitrobenzimidazole and picric acid, using DC voltammetry (DCV) and differential pulse voltammetry (DPV) at a polished silver solid amalgam composite electrode (p-AgSAE-CE) in the aqueous solution of Britton-Robinson (BR) and finding of the limit of quantification (L_Q) for these substances. For 5-nitrobenzimidazole, the optimum conditions of voltammetric determination have been found in the medium of B-R buffer pH 5, but any calibration dependences were obtained. The reason was the deteriorating quality of 5-nitrobenzimidazole response even if the routine pretreatment of working electrode was maintained. This resulted in obtaining of irreproducible results upon the determination of 5-nitrobenzimidazole. For picric acid, the optimum conditions have been found for both DPV and DCV at p-AgSAE-CE in the medium of B-R buffer pH 2. The concentration dependences were measured in the range $1 \cdot 10^{-6}$ - $1 \cdot 10^{-4}$ mol.L⁻¹ for DPV with the value of reached L_Q $2,5 \cdot 10^{-7}$ mol.L⁻¹ and, for DCV, in the range $1 \cdot 10^{-7}$ - $1 \cdot 10^{-4}$ mol.L⁻¹ with L_Q calculated as $5,5 \cdot 10^{-8}$ mol.L⁻¹. For comparison of newly developed voltammetric methods of picric acid determination, a UV-VIS spectrophotometric determination in deionized water was developed in the concentration range $2 \cdot 10^{-6}$ - $1 \cdot 10^{-4}$ mol.L⁻¹ with L_Q reached $2,5 \cdot 10^{-6}$ mol.L⁻¹.