Abstract

The voltammetric behavior of selected nitrophenols (2-nitrophenol, 4-nitrophenol, 2,4-dinitrophenol and 2,4,6-trinitrophenol) was investigated by differential pulse voltammetry (DPV) and by adsorptive stripping voltammetry (AdSV) at an unmodified electrode (CPE) and a clay-modified carbon paste electrodes modified by montmorillonite (MMT-CPE) and sepiolite (SEP-CPE) using electrochemical reduction and oxidation in Britton-Robinson buffer. For reduction, optimum conditions have been found at pH 2 for 2-NP and 4-NP, at pH 3 for 2,4-DNP and at pH 4 for 2,4,6-TNP. For oxidation, optimum conditions have been found at pH 2 for 2-NP and 4-NP and at pH 5 for 2,4-DNP. Voltammetric determination using electrochemical oxidation is not a suitable method for 2,4,6-TNP. The lowest detection limits were obtained for 2-NP using cathodic AdSV on SEP-CPE with $2.9 \times 10^{-7}$ mol.dm$^{-3}$, for 4-NP using cathodic DPV on MMT-CPE with $2 \times 10^{-6}$ mol.dm$^{-3}$, for 2,4-DNP using cathodic AdSV on SEP-CPE with $2.7 \times 10^{-7}$ mol.dm$^{-3}$ and for 2,4,6-TNP using cathodic DPV on unmodified electrode with $4.8 \times 10^{-7}$ mol.dm$^{-3}$. Determination of mixture 2-NP and 4-NP and the possibility of the selective determination using open circuit sorption with DPV detection was further studied.