

## **Abstract**

The aim of presented Bachelor Thesis was to study an electrochemical behavior of 4-nitrophenol (4-NP) resulting in the founding of optimum conditions for its determination at newly prepared large-surface carbon film electrode (ls-CFE) using DC voltametry (DCV) and differential pulse voltammetry (DPV). Voltammetric behavior of 4-NP was investigated in dependence on the pH of the medium (realized using Britton-Robinson buffer). As optimum pH values for voltammetric determination of 4-NP at ls-CFE in cathodic potentials region, the pH values 6.0 (for DCV) and 7.0 (for DPV) were chosen. The determinations of 4-NP at ls-CFE (at a concentration of the analyte of  $1 \cdot 10^{-4}$  mol/l) showed a good repeatability for both voltammetric techniques used (2.2 % for DCV and 0.4 % for DPV). Therefore, the possibility of an electrochemical regeneration of the electrode surface has not been further investigated. Under optimum conditions, the calibration dependences of 4-NP were measured in the concentration range from  $2 \cdot 10^{-6}$  to  $1 \cdot 10^{-4}$  mol/l, with limits of quantification ( $L_Q$ ) of  $2.3 \cdot 10^{-6}$  mol/l (for DCV at ls-CFE) and  $1.8 \cdot 10^{-6}$  mol/l (for DPV at ls-CFE). The applicability of the newly developed methods of the determination of 4-NP was verified on the model samples of drinking water, with  $L_Q$  of  $1.0 \cdot 10^{-6}$  mol/l (for DCV at ls-CFE) and  $1.3 \cdot 10^{-6}$  mol/l (for DPV at ls-CFE).