

Abstract

In this work, separation conditions of aminoderivatives of polycyclic aromatic hydrocarbons (APAH) mixture were optimized by high performance liquid chromatography with amperometric detection. For the purpose of comparison, the spectrophotometric detector was connected in series with the electrochemical detector. Three-electrode system in the wall-jet arrangement with carbon paste working electrode was chosen for amperometric determination.

For the purpose of the optimization, design of experiment was employed, specifically Box-Behnken Design which uses three levels of values of each parameter. Studied parameters were pH of acetate-phosphate buffer, initial percentage of the methanol in mobile phase and its gradient. Derringer's desirability function was applied to evaluate the compromise between the analysis time and the resolution of neighbouring peaks.

Using the amperometric detection, ten times lower limits of detection were achieved in comparison with spectrophotometric detection. After preconcentration of the mixture of analytes in the river water by the solid phase extraction, the lowest limit of detection was gained for 2-aminobiphenyl ($2 \cdot 10^{-10}$ g ml⁻¹) and the highest for 2-aminofluorene ($1 \cdot 10^{-9}$ g ml⁻¹).