

Abstract

This work is devoted to the study of boron doped diamond as electrode material, its properties and use in electroanalytical methods – in voltammetric and subsequently amperometric methods in combination with high performance liquid chromatography.

The series of boron doped diamond films was tested with respect to the effect of boron concentration on their morphology, quality, electrochemical and spectral properties using scanning electron microscopy, atomic force microscopy, Raman spectroscopy, and cyclic voltammetry and differential pulse voltammetry. Further, the effect of boron concentration on the determination of selected substances was investigated, both for their oxidation (2-aminobiphenyl, benzophenone-3) and for their reduction (5-nitroquinoline).

Furthermore, a voltammetric and amperometric method was developed for the determination of a mixture of aminobiphenyls and aminonaphthalenes using a boron doped diamond electrode.

The effects of activation cleaning programs on the signal of benzophenone-3 were investigated using a boron doped diamond electrode, and the determination of benzophenone-3 on boron doped diamond electrode in the presence of the selected surfactant was studied.

Boron doped diamond as carbon-based material was compared with other selected carbon materials such as glassy carbon and carbon film and their modifications. Their use has been tested for the determination of 1-aminonaphthalene and 2-aminonaphthalene.