Abstract

This bachelor's thesis deals with the modification of a boron-doped diamond electrode (BDDE) by the electrochemical oxidation of *p*-aminobenzoic acid. Subsequently, the stability of the modified electrode was investigated by a study of various parameters.

The modification of the electrode was performed using cyclic voltammetry (CV) in $LiClO_4$ electrolyte. The success of the modification and its subsequent stability was investigated by the CV method in electrolyte KCl in the presence of the redox system $[Fe(CN)_6]^{4-/3-}$.

Stability was tested in terms of ultrasonic cleaning in isopropanol and anodic cleaning in 0.5 mol l^{-1} H_2SO_4. It was found that the modification of the surface cannot be completely removed by ultrasonic cleaning in isopropanol, in contrast, pulses of period 2 seconds with a high positive potential are enough to completely remove the modification.

Optimal conditions for surface stability were determined. The ideal number of cycles for surface modification was set at 5 cycles. The use of different electrolytes during modification ($KClO_4$ and $LiClO_4$) determined that in the case of modification in the $KClO_4$ electrolyte, it is possible to measure in the range of the potential window from –400 to +1600 mV and in the case of $LiClO_4$ in the range of –400 to +1500 mV without breaking the modified layers. From the point of view of aging of the electrode, greater stability appeared for the modification in the presence of $LiClO_4$.

Key words:

Boron-doped diamond electrode

Cyclic voltammetry

p-aminobenzoic acid

Modification of the electrode surface

Grafting