IMPEDANCE CHARACTERISTICS OF VOLTAMMETRIC ENANTIOSELECTIVE SENSORS BASED ON POLYARYLENEPHTHALIDES AND CYCLODEXTRINS

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The voltammetric method of analysis introduces rigid requirements to the surface of the working electrode, the state of which directly depends on the reproducibility of the results of the analysis. Nowadays there are popular methods of studying surface morphology, such as AFM, SEM. These methods require highly qualified personnel and expensive equipment. An alternative to surface research is the spectroscopy of electrochemical impedance.

Electrochemical impedance spectroscopy is a highly sensitive method that makes it possible to evaluate the state of the electrode surface in the form of simple equivalent electrical circuits.

In this study, composite voltammetric sensors based on glassy carbon electrodes were studied. As composites were used a conductive polymer film of polyarylenephthalides (PAF) and α-, β- and γ-cyclodextrins (CD). Composite modifiers based on cyclodextrins under voltammetry conditions allow to recognize the enantiomers of biologically active substances, such as propranolol, tryptophan, etc. Impedance characteristics of the proposed composites were carried out in a solution of $Fe(CN)_6]^{4-/3-}$ as in a standard solution. The working conditions for recording the impedance spectra and deposition of polymer films were selected (Fig.).

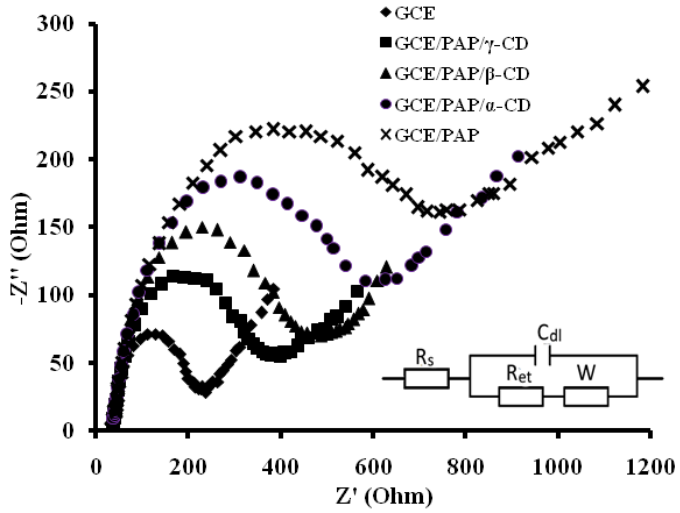

Fig. Impedance spectra recorded on modified GCE in a solution of $Fe(CN)_6]^{4-/3-}$

As seen from Fig. the lowest resistance of electron transfer was observed on the bare electrode, and the largest - on the electrode covered by PAF. The spectra of electrodes modified by cyclodextrins were located between them, and the resistance to electron transfer decreased from gamma to alpha. We assume that this is possibly associated with different cavity sizes in the structure of cyclodextrins.

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