The study of voltammetric behavior of the electrode/engine oil/marker system using PCA and PLS

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The areas of study of voltammetric and potentiometric electronic tongues are restricted mainly by electrochemically active materials, whereas non-electroactive components usually studied using the methods of impedance spectroscopy. At the same time, the multicomponent solutions consisting of electroactive and non-electroactive components (technical liquids, food industry, pharmaceuticals, environmental objects, etc.) aren't less relevant for voltammetric study. The voltammetric measurements in such systems can be carried out by use of the electrodes which are include the test substances. In this case, the test substances will influence to the magnitude of the detected signal and the shape of a voltammogram. However, physico-chemical characteristics and properties of these electrodes have been poorly studied.

Voltammetric study and applying of chemometric methods PCA and PLS in electronic tongue on the basis of carbon-paste electrodes containing electroactive and non-electroactive components for multicomponent solutions identification have been presented. The values of the peaks current constants on voltammograms of nitrocompounds reduction and the dependence of maximum of peaks current from scan rate, from accumulation time, from the polarizing voltage shape have been calculated. Using PLS the relationship between residual and Faraday currents on voltammograms of nitrocompounds reduction, physico-chemical characteristics of motor oils and IR spectroscopy data has been established.

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