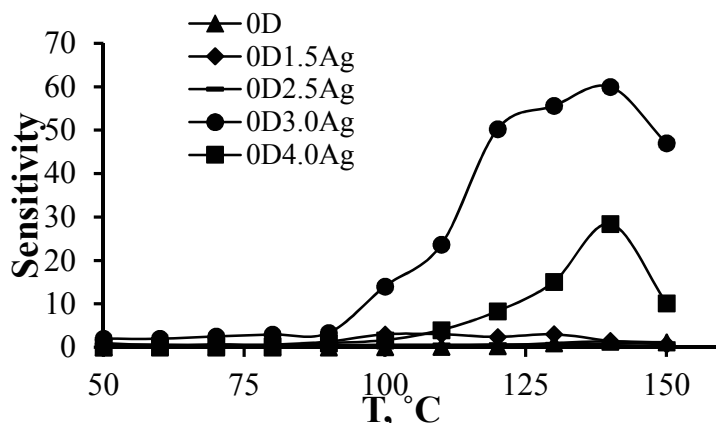


atmosphere (1000 ppm) in the temperature range $50 \div 150$ °C at the initial voltage of 5V (Fig. 1).



As one can see the adding of argentum has an ambiguous effect on the sensitivity values. With increasing Ag content to 3% the sensitivity of tin (IV) oxide samples increases with reaching its maximum value for the 0D3.0Ag sample at 140 °C. But the further increasing of argentum content leads to the reduction of the sensor respond. Thus, it was shown that the sensitivity of SnO₂ nanostructures strongly depend on the modifier content.

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THE RESEARCH OF MODIFIED BY "SMART POLYMERS" ELECTRODE'S SURFACE USING IMPEDANCE SPECTROSCOPY

At this moment, the field of electrochemistry is rapidly developing to create specific sensors and sensory systems based on them. One of the main

types of these sensors is the modification of the electrode's working surface by conductive polymer substrates specific to the analyt. However, for obtain reproducible results and to achieve the best sensitivity of the sensor is necessary to study the surface layer and select the operating conditions. The fundamental methods of studying the surface are methods of microscopy, such as atomic-powered and scanning electron microscopy. Nevertheless, their use is greatly limited to the cost of expensive devices and highly qualified staff. The simpler method for surface control is electrochemical impedance spectroscopy, which you can use to explore some particularities of the working electrode's surface in a private cell, keeping the registration conditions.

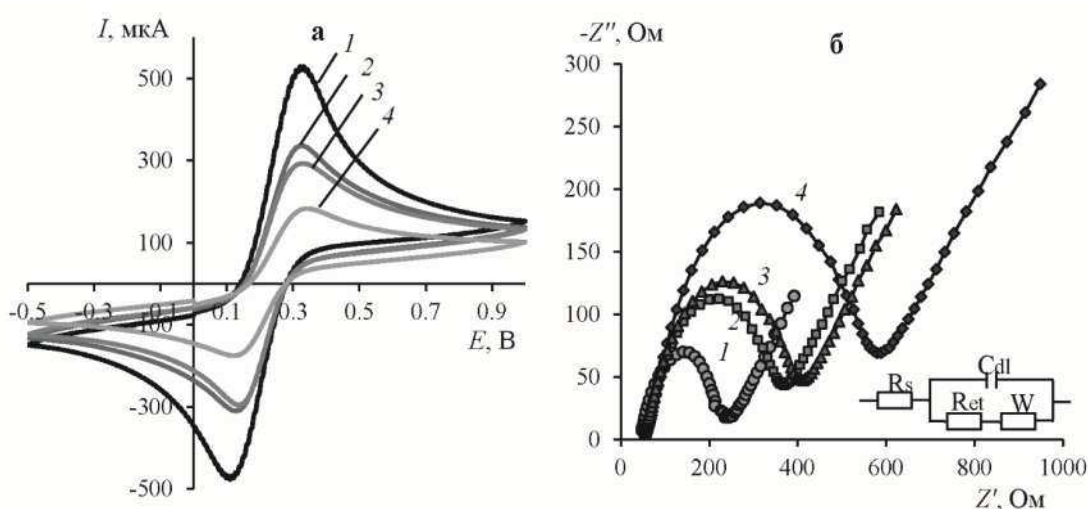


Fig. 1. CVs (a) and Nyquist plots (b) of 5.0 mM solutions redox couple $[\text{Fe}(\text{CN})_6]^{3-/4-}$ on the different electrode (1 – GCE; 2 – GCE/PPB-Cl; 3 – GCE/PPB-Br; 4 – GCE/PPF-Cl) in the supporting electrolyte solution 0.1 M KCl at 100 mVs^{-1} .

In this work voltammetric sensors based on a glassy carbon electrodes (GCE) modified by "smart polymers" are studied by electrochemical impedance spectroscopy. As "smart polymers" in this work were used chlorinated (to position 4) poly(phtalidilidenfluorene) (PPF-Cl) and poly(phtalidilidenbiphenyl) (PPB-Cl), brominated (to different position of cycle) poly(phtalidilidenbiphenyl) (PPB-Br). A standard redox pair of hexacyanoferrates was used to study the electrical conductivity of composite electrodes. Figure 1 shows cyclic voltammograms and Nyquist diagrams. From voltammograms it can be seen that modifying an electrode with «smart polymers» reduced the peak oxidation of hexacyanoferrates compared to a bare electrode. From the Nyquist diagram, it can be seen that the spectra were well described by an equivalent electric circuit, where R_{et} showed the resistance to the electron transfer at the electrode-solution interface and it was

shown in the graph as a semicircle of the impedance spectrum. The impedance spectrum showed that the electrode modified by PPF-Cl had the highest resistance relatively bare electrode.

Thus, the modified glassy carbon electrode also has standard forms of voltammograms and impedance spectra, which makes it possible to use them in voltammetry.

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ACID-BASIC AND SORPTION CHARACTERISTICS OF TUNGSTEN-CONTAINING MATERIALS BASED ON SAPONITE CLAY

Existing problems in the development of non-waste technologies of the natural resource usage are associated with the search of the effective integrated treatment methods of industrial wastes and the use of cheap natural materials.

The use of saponite clay as a sorbent is becoming increasingly relevant. Saponite clay is the cheap natural sorbent, it is the laminate silicate of the montmorillonite group. It is known that the modification of natural sorbents leads to the increase in their specific surface area and sorption activity, which can be explained by changes in the acid-base and structural characteristics of the sorbent surface. It was shown previously [1] that saponite has the specific surface area of 35 m²/g with the maximum pore diameter of 4 nm. Based on the shape of the hysteresis loop of the nitrogen adsorption-desorption isotherms, pores have shape of cylinders opened on both sides. It was also shown that the modification of natural saponite clay by magnetite results in the increasing of the specific surface area up to 69 m²/g and the