S.V. Nahirniak, T.A. Dontsova
National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute»
Kyiv, Ukraine

EFFECT OF ARGENTUM ON SENSITIVITY OF SnO_2 NANOSTRUCTURES TO ETHANOL

Ethanol is a good solvent, presrvative and has excellent antibacterial properties. Ethanol belongs to the group of depressants and cause negative influence on the central nervous system, can inhibit or paralyze it completely, the usage of ethanol can lead to gastrite or stomach disorder. Thus, the control and detection of ethanol is an important task. Ethanol gas sensors use for equipping of premises in industry where production processes may be associated with the probable possibility of the ethanol excess in the atmosphere of the working area air. Besides, such devices widely used as alchohol testers and exhalation detectors in medicine. Existing ethanol gas sensor based on metal oxide operate at high temperatures [1] which results in higher power consumption, thus the development of low-temperature high performance sensor device is an important task for researchers nowadays.

Tin (IV) oxide is a promising material for gas sensor application and the performance of semiconducitng sensor devices can be significantly improved by modification of nanosized SnO_2 [2].

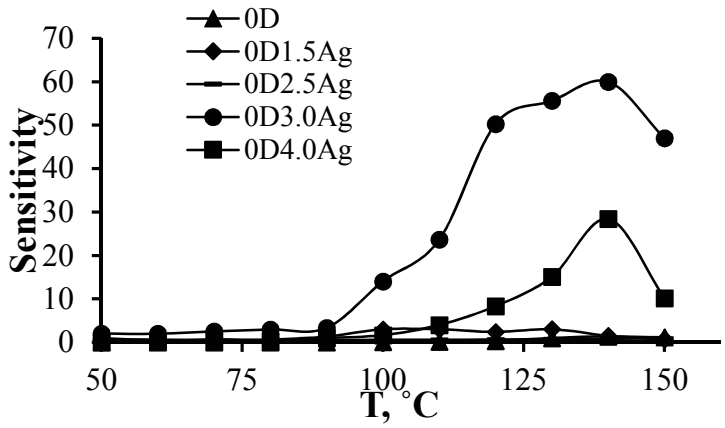
In this work SnO_2 nanostructures were synthesized from tin (II) oxalate by chemical vapor deposition method in the inert nitrogen atmosphere at 1123 K [3]. Obtained tin (IV) nanostructures were modified by argentum. The modification was carried out by the impregnation method using a certain concentration of the $AgNO_3$ solution. After drying for 1 hour at 383 K and further calcination at 673 K for 2 hours, SnO_2 samples with different content were obtained(Table 1) [4].

Table 1. – Synthesized tin (IV) oxide nanosructures

Sample	Content of Ag, %
0D	0.0
0D1.5Ag	1.5
0D2.5Ag	2.5
0D3.0Ag	3.0
0D4.0Ag	4.0

Sensitivity of SnO_2 samples to ethanol were determined as the ratio of the resistance of sensitive layer at ambient to its resistance in the ethanol

atmosphere (1000 ppm) in the temperature range 50 ÷ 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 SnO_2 nanostructures strongly depend on the modifier content.

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N.A. Nikonova, R. A. Zilberg, L. R. Kabirova, D. I. Dubrovsky, Y.K. Kosihina, Y.A. Yarkaeva
(BSU, Ufa)

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

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