

Nanostructured surfaces

Electrophysical features of $\text{In}_2\text{O}_3+(5\%)\text{SnO}_2/\text{Si}$ heterostructures based on Si substrates of different type

V.A. Vinichenko, N.S. Holoborodko, O.Ye. Lushkin, V.M. Telega

*National Taras Shevchenko university of Kyiv, Faculty of Radiophysics,
Electronics and Computer Systems.
64, Volodymyrska st., Kyiv, 01033, Ukraine
E-mail: Vinichenko_S@i.ua*

Recently, quite a lot of attention is paid to the study of structures that can be used as sensitive elements in gas sensors. Urgent is the studying of electrophysical properties of these structures in order to increase their sensitivity [1]. Current-voltage characteristics (CVC) of structures $\text{In}_2\text{O}_3+(5\%)\text{SnO}_2/\text{Si}$ depending on effective surface area of nanostructured films and surrounding gas medium are presented.

Experimental research of heterostructures based on two types of p-type silicon substrate, i.e. the usual silicon substrate and the textured silicon substrate (textured by chemical etching method), was carried out. Both types of substrates were covered by films of indium-tin oxide (ITO) with a thickness of 6 nm.

ITO film was deposited on prepared silicon plates (textured and not textured) by reactive magnetron sputtering.

This paper considers the properties, which are caused by textured surface, on the amount of response to changes in surrounding gas medium. It is shown that the textured surface has a higher sensitivity to alcohol vapor versus non textured samples.

1. Yamazeo N., Miura N.. Some basic aspects of semiconductor gas sensor. // Chemical Sensor Technology.-1992.- 4.-P. 19.