

Effect of temperature on the NO/sub 2/ sensing properties of tellurium based films

A. Tsiulyanu, D. Tsiulyanu, H. -. Liess

<https://doi.org/10.1109/SMICND.2004.1403039>

Abstract

Influence of temperature on the electrical and sensing properties toward NO/sub 2/ of tellurium based films were investigated. Temperature-dependent electrical conductivity is strongly affected by the presence of an NO/sub 2/ environment. The sensitivity toward NO/sub 2/, being controlled by gas concentration, decreases with the operating temperature increase. On the other hand, the increase of operating temperature leads to a reduction of response-recovery times. The results are discussed taking into consideration the contributions of grain boundary as well as grain bulk and surface resistance to the total conductivity. It is assumed that the surface, including grain boundary, hole-enriched region is formed as a result of dangling bond chalcogen's lone-pair electron interaction. Chemisorption of NO/sub 2/ molecules is accompanied by hole enrichment of the surface and grain boundary region, due to interaction of these molecules with lone-pair electrons.