

# **Nitrogen dioxide sensing properties of tellurium based films by thermal treatment**

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## **Abstract**

Influence of annealing on the electrical and sensing properties toward NO<sub>2</sub> of tellurium based films were investigated. The annealing at temperatures more than 100 °C causes a sharp decrease both of electrical resistance and sensitivity of the films. SEM analyzes indicated the annealing-induced structural evolution of the films, including the growing of large crystals incorporated into basic matrix. The results are discussed taking into concentration the intrinsic character of conductivity typical for used films, which can be modified in a dopant-like one at a semiconductor surface. It is assumed the surface hole-enriched region to be formed as a result of dangling bond-chalcogen's lone-pair electron interaction. Chemisorption of NO<sub>2</sub> molecules is accompanied by holes enrichment of the surface like-dopant region, due to interaction of these molecules with lone-pair electrons.