

# SYNTHESIS AND ANALYSIS OF TUNGSTEN OXIDE THIN FILMS FORMED BY MAGNETRON SPUTTERING

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Tungsten oxide (WO<sub>x</sub>) films are interesting due to their properties in many fields of research: catalytic properties, electro-chromism and potential usage in gas sensing [1, 2]. There are many possible techniques for making WO<sub>x</sub> thin films. One of them is magnetron-sputtering technique [3]. The aim of this research was to prepare WO<sub>x</sub> structures and to study dependency of its properties from the thin films thickness and substrate temperature.

In this work WO<sub>x</sub> films thickness in a range from 50 to 400 nm were deposited by magnetron-sputtering technique on a silicon substrate at different temperatures: 200, 400 and 600 °C. It was investigated how such parameters as the layer thickness and substrate temperature during deposition affects WO<sub>x</sub> crystal structure and band-gap width. It was also tested how the conductivity of these samples depends on the adsorption of various analytes. This was done to determine the best working configuration for further experiments and analysis.

Surfaces of prepared samples were investigated by using scanning electron microscopy, crystal phase composition by using X-Ray diffraction measurements and band-gaps were calculated by using ellipsometry measurements data.

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