

FORMATION OF ϵ -PHASE WO_3 NANOSTRUCTURES FOR SENSOR APPLICATIONS.

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Ferroelectric phase of tungsten trioxide, called ϵ -phase, appears as result of high pressure treatment or temperature decrease up to -40 °C [1-3]. Because of pressure and temperature effect oxygen atoms in the WO_3 structure are shifted from equilibrium positions. It results in dipole formation in WO_3 ϵ -phase and its ferroelectric properties [3]. The decrease of grain size in metal oxides led phase transitions even at room temperatures [3]. WO_3 ϵ -phase nanostructures showed good sensitivity to acetone.

Laser ablation method allowed to depositing WO_3 thin films with 7-15 nm grain size [4]. The influence of substrate temperature and oxygen concentration on structural, optical and sensitive properties of WO_3 films has been studied [4]. However, room temperature deposition and thermal treatment effects and their impacts on phase transition, structural and optical properties of nanocrystalline tungsten trioxide films haven't been performed in details.

In the present work nanocrystalline tungsten trioxide films, deposited at room temperatures have been investigated with XRD, Raman and transmittance measurements. Post annealing influence on ϵ - WO_3 formation and phase transitions has been reported.

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