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THE SYNTHESIS AND CHARACTERIZATION OF TUNGSTEN OXIDE WO₃ NANOSTRUCTURES THIN FILMS FOR GAS SENSING APPLICATIONS

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Tungsten oxide (WO₃) thin films for gas sensing have been successfully deposited using reactive direct current (DC) magnetron sputtering at different deposition temperatures (300 °C, 400 °C and 500 °C). The structural, morphological properties, thickness and composition have been investigated using X-ray diffraction (XRD), scanning electron microscopy (SEM) and Rutherford backscattering spectrometry (RBS) techniques. To investigate the effect of deposition temperature on the gas sensing properties of deposited thin films on alumina substrates was conducted using the Kenosistec gas sensing unit. WO₃ thin film deposited at 500 °C exhibited a higher response when sensing Nitrogen dioxide (NO₂) at room temperature as compared to the thin films prepared at 300 °C and 400 °C, respectively. However, as deposited WO₃ thin films exhibited low sensitivity when sensing reducing gases such as hydrogen (H₂) and ammonia (NH₃), which was an indication of good selectivity properties of WO₃ related sensors.

Apply to be considered for a student award (Yes / No)?

YES

Level for award (Hons, MSc, PhD, N/A)?

MSc

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