



Contribution ID: 194

Type: Oral Presentation

## THE SYNTHESIS AND CHARACTERIZATION OF TUNGSTEN OXIDE WO<sub>3</sub> NANOSTRUCTURES THIN FILMS FOR GAS SENSING APPLICATIONS

Wednesday, 10 July 2019 11:20 (20 minutes)

Tungsten oxide (WO<sub>3</sub>) 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. WO<sub>3</sub> thin film deposited at 500 °C exhibited a higher response when sensing Nitrogen dioxide (NO<sub>2</sub>) at room temperature as compared to the thin films prepared at 300 °C and 400 °C, respectively. However, as deposited WO<sub>3</sub> thin films exhibited low sensitivity when sensing reducing gases such as hydrogen (H<sub>2</sub>) and ammonia (NH<sub>3</sub>), which was an indication of good selectivity properties of WO<sub>3</sub> related sensors.

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

YES

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

MSc

**Primary author:** Mr MPANZA, Thokozani (University of Zululand)

**Co-author:** Dr NDLANGAMANDLA, Cebo (University of Zululand)

**Presenter:** Mr MPANZA, Thokozani (University of Zululand)

**Session Classification:** Physics of Condensed Matter and Materials

**Track Classification:** Track A - Physics of Condensed Matter and Materials