



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Contribution ID: 128

Type: Oral Presentation

Effects of the substrate temperature on the properties of vanadium dioxide nano-coatings deposited on glass substrate by inverted cylindrical magnetron sputtering

Tuesday, 10 July 2012 11:20 (20 minutes)

Abstract content
 (Max 300 words)

Vanadium dioxide thin films have been known as the most feasible thermochromic nano-coatings for smart windows, which self control the solar radiation and heat regulation both in buildings and automobiles. Such an attractive technological application is due to the fact that VO₂ crystals exhibit a fast semiconductor-to-metal phase transition at a transition temperature of about 68°C, together with sharp optical changes from high transmittive to high reflective coatings in the IR spectral region. The phase transition has been associated to the nature of the microstructure, stoichiometry and some other surrounding parameters of the oxide. This study reports on the effect of the crystallographic quality controlled by the substrate temperature on the thermochromic properties of VO₂ thin films synthesized by inverted cylindrical magnetron sputtering. Vanadium dioxide thin films were deposited on glass substrate at various temperatures between 350 to 600 degrees celcius, deposition time kept constant at 1 hour. Prior the experiment, deposition conditions such as base pressure, oxygen pressure, rf power and target-substrate distance were carefully optimized for the quality of VO₂ thin films. The reports results are based on AFM, XRD, RBS, ERDA and UV-VIS

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

yes

Level for award
(Hons, MSc,
 PhD)?

MSc

Main supervisor (name and email)
and his / her institution

Prof malik maaza, ithemba labs. maaza@tlabs.ac.za

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

no

Primary author: Mr MADIBA, itani given (university of western)

Presenter: Mr MADIBA, itani given (university of western)

Session Classification: DCMPM1

Track Classification: Track A - Division for Condensed Matter Physics and Materials