



Contribution ID: 75

Type: Oral Presentation

Ion beam effects in thin metallic films due to Elastic Recoil Detection Analysis using 26 MeV Cu⁷⁺ ions.

Tuesday, 8 July 2014 15:00 (20 minutes)

Abstract content
 (Max 300 words)
 http://events.saip.org.za/getFile.py/?target=_blank
 Formatting & Special chars

Heavy Ion Elastic Recoil Detection (Heavy Ion-ERD) analysis is now an established thin film depth profiling analysis technique. But it is not without artefacts. The main aim of this study is to investigate the effects of the probing beam on the structure (i.e. thickness, atomic composition, crystallinity, roughness) of metallic thin films after Heavy Ion ERD analysis using 26 MeV Cu⁷⁺ beams. Heavy Ion ERD analysis was carried out to determine the thickness and the depth profile of ZrN and NbN thin films prepared through RF magnetron sputtering deposition on silicon substrates. The structural characterization of these thin films was carried out before and after Heavy Ion ERD analysis to check for beam effects on the films. Possible beam damage on the surface of these thin films was assessed by various techniques such as; Rutherford Backscattering Spectrometry (RBS) which was used to determine (any) changes in film thickness and composition, Atomic Force Microscopy (AFM) used to obtain the surface roughness and morphology of the thin films and X-ray diffraction (XRD) used to determine the crystallinity and the residual stress. This presentation discusses findings made from the measurement results.

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

No

Level for award (Hons, MSc, PhD)?

MSc

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

Dr Mandla Msimanga, mandla@tlabs.ac.za and iThemba LABS (Gauteng) & Tshwane University of Technology

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

No

Primary author: Mr MAVHUNGU, Humbulani (NECSA)

Co-author: Dr HLATSHWAYO, Thulani (University of Pretoria)

Presenter: Mr MAVHUNGU, Humbulani (NECSA)

Session Classification: DPCMM2

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