Contribution ID: **91** Type: **Oral Presentation**

Structural,Electrical and Electronic Properties of Diamond Like Carbon (DLC) and Cabon-Based Materials

Tuesday, 8 July 2014 10:20 (20 minutes)

Abstract content
   (Max 300 words)
Formatting &
Special chars

ABSTRACT

In this work, the structural and electronic properties of diverse diamond-like carbon (DLC) also known as hydrogenated amorphous carbon (a-C:H), silicon doped DLC (a-C:H:Si) thin films on (001)Si deposited by plasma enhanced chemical vapour deposition (PECVD) are studied under different applied bias voltages (100V<Vb<600V). Silicon doped with DLC thin films was attained by using tetramethysilane (TMS) as a precursor at different standard centimetre cube per minute (sccm). Nitrogen doping in amorphous carbon (a-C:Nx) thin films was achieved by pulsed laser deposition (PLD) process and studied their different properties. Different nitrogen concentration (at.%) of a-C:Nx thin films were deposited on silicon substrate using nitrogen as a precursor gas. The thicknesses of all thin films were ˜150 15 nm controlled and monitored during deposition process. Raman spectroscopy of these thin films was measured by using two different laser excitation wavelengths viz 488 nm and 647 nm respectively. The microstructure and electronic property of these samples were investigated by Raman spectroscopy and the electrical property was studied by current-voltage (I-V) characteristics. Finally, a correlation among the electrical properties, electronic properties and microstructure properties were established based on their sp3 and sp2 concentration in the thin film structure.

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

yes

Level for award
 (Hons, MSc,
   PhD)?

Msc

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

Bhekumusa Mathe
Bhekumusa.Mathe@wits.ac.za

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

no

Primary author: Mr MBIOMBI, Wilfred (University of the Witwatersrand)

Co-authors: Dr WAMWANGI, Daniel (University of the Witwatersrand); Dr BHEKUMUSA, Mathe (University of the Witwatersrand); Dr ERAMUS, Rudoph (University of the Witwatersrand); Prof. RAY, Sekhar (UNISA)

Presenter: Mr MBIOMBI, Wilfred (University of the Witwatersrand)

Session Classification: DPCMM2

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