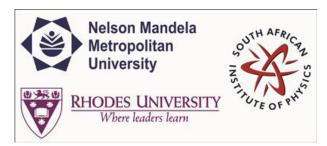
SAIP2015



Contribution ID: 152

Type: Oral Presentation

Embedding of noble metal nanoparticles and study of optical and photoluminescence properties induced by ion irradiation

Thursday, 2 July 2015 09:40 (20 minutes)

Abstract content
 (Max 300 words)
Formatting &
Special chars

Recent advances in nanotechnology resulted in a new class of nanomaterials with optical as well as luminescence properties called noble metal fluorescent nanoparticles. These noble metal nanoparticles have shown potential applications in many fields like optical memory, catalysis and sensor technologies [1]. The present work reports on 150 keV Ar ion beam irradiation of thin Au film on polymer substrates including dewetting in thin film and subsequent formation of spherical Au nanoparticles that at a proper fluence eventually become embedded into the substrate [2]. Au nanoparticles embedded in and located on the surface were characterised and studied by scanning electron microscopy (SEM), atomic force microscopy (AFM), transmission electron microscopy (TEM) and Rutherford backscattering spectrometry (RBS) [3]. These Au nanoparticles exhibit the presence of absorption peaks in the visible regions due to the surface plasmon resonance (SPR) oscillations as investigated by UV-Vis spectroscopy. Photoluminescence study using the 325 nm He-Cd laser excitation will also be discussed.

References:

Li-Yi Chen, Chia-Wei Wang, Zhiqin Yuan, and Huan-Tsung Chang, Analytical Chemistry, 87 (2015) 216.
Jai Prakash, A. Tripathi, S. Gautam, K. H. Chae, V. Rigato, J. Tripathi, K. Asokan, Mat. Chem. Phys. 147 (2014) 920

3. Jai Prakash, A. Tripathi, V. Rigato, J.C.Pivin, Jalaj Tripathi, K.H.Chae, S.Gautam, P.Kumar, K. Asokan, D.K.Avasthi, J. Phys.D: Appl. Phys. 44 (2011) 125302.

Acknowledgement: Author (JP) acknowledges the help and scientific discussions from Dr. D. K.Avasthi, Dr. A. Tripathi, and Dr. Pravin Kumar for providing LEIBF facility at IUAC, New Delhi.

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

No

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

N/A

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

Prof. H.C.Swart

Department of Physics, University of the Free State (UFS), Bloemfontein, ZA 9300, South Africa

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

yes

Please indicate whether
this abstract may be
published online
(Yes / No)

Yes

Primary author: Dr PRAKASH, Jai (Department of Physics, University of the Free State, (UFS), Bloemfontein, ZA 9300, South Africa)

Co-authors: Prof. SWART, H C (Department of Physics, University of the Free State (UFS), Bloemfontein, ZA 9300, South Africa); Dr ASOKAN, K (Inter University Accelerator Centre (IUAC), Aruna Asif Ali Marg, New Delhi 110067, India); Dr CHAE, K H (Advanced Analysis Center, Korea Institute of Science and Technology (KIST), Seoul 136e791, Republic of Korea); Prof. KROON, R E (Department of Physics, University of the Free State (UFS), Bloemfontein, ZA 9300, South Africa); Dr GAUTAM, S (Advanced Analysis Center, Korea Institute of Science and Technology (KIST), Seoul 136e791, Republic of Korea); Dr GAUTAM, S (Advanced Analysis Center, Korea Institute of Science and Technology (KIST), Seoul 136e791, Republic of Korea); Dr RIGATO, V (INFN Laboratori Nazionali di Legnaro, Via Romea. 4, 35020 Legnaro, Padova, Italy); Dr KUMAR, Vinod (Department of Physics, University of the Free State (UFS), Bloemfontein, ZA 9300, South Africa)

Presenter: Dr PRAKASH, Jai (Department of Physics, University of the Free State, (UFS), Bloemfontein, ZA 9300, South Africa)

Session Classification: DPCMM

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