

8th International Conference and Exhibition on

LASERS, OPTICS & PHOTONICS

November 15-17, 2017 | Las Vegas, USA

Transition metal oxide thin film-applications

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Transition metal oxides (TMO) is an interesting group of solid materials with a wide variety of structural, optical, electrical and magnetic properties. The general formulae of transition metal oxides M_nO_{2n+1} where M represents the transition metal. They have two dimensional vander-Waal's bonded layered structures (Ex: V_2O_5 , MoO_3) or three dimensional frame work tunnel structures (Ex: WO_3 , $LiCoO_2$) which lead the materials for their applications in the field of Electrochromic and Opto Electronic Devices. The combination of solid state materials science with thin film technology has significantly reduced the size of component and leads to micro electronic, micro ionic, electrochromic devices and display systems. Thin film deposition consists of three major phases. In the first phase, the material should be in the proper form to deposit. In the second stage, it was transported through the medium and in the third stage it should deposit on the substrate to form a continuous film. The films can be prepared by various physical vapour deposition techniques like thermal, electron beam, sputtering, so on and chemical vapour deposition techniques like sol-gel, spin coating, spray pyrolysis so on. Depending on the deposition parameters one can deposit amorphous, polycrystalline and nanocrystalline thin films for their effective utilisation in emerging technology. These films will be characterized for their composition, structure, morphology, vibrational and optical studies by using x-ray photo electron spectroscopy, x-ray diffraction, atomic force microscopy, infrared spectroscopy, Raman spectroscopy and UV-VIS spectroscopy.

Biography

K V Madhuri has completed her PhD from Sri Venkateswara University and Post-doctoral studies from Universite de Moncton, Canada. She is working as an Assoc. Professor/Assoc. Dean of Research and Development, in an esteemed University. She has published 17 papers in reputed international journals and has been serving as an Editorial Board Member of reputed journals. She has presented about 27 research papers in national/international conferences. In addition to this, she has delivered invited talks in reputed institutes/conferences/workshops/orientation programmes. She has recently finished a project under Young Scientist scheme by Department of Science and Technology, New Delhi, India.

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