

Seminar

Institute for Plasma Research

Title : Studies on compound semiconductor (ZnGa_2Se_4) thin film electronic devices

Speaker: Dr. Vishal Dhamecha
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Date : 18th Nov 2021 (Thursday)

Time : 03:30 PM

Venue : Online- Join the talk:

<https://meet.ipr.res.in/Dr.VishalDhamecha> PDFTalk

Abstract:

The synthesis of the evaporant charge of ZnGa_2Se_4 semiconducting compound is grown by direct fusion method and confirmed by XRD and EDAX. The detailed investigation on growth of ZnGa_2Se_4 thin films by flash evaporation technique at different substrate temperatures. The influence of the substrate temperatures on the structure, orientation, composition and stoichiometry of the ZnGa_2Se_4 thin films are studied by TEM and EDAX. The surface roughness and morphological characteristics of ZnGa_2Se_4 films deposited at various substrate temperatures studied using AFM. The effect of substrate temperatures on the resistivity, the activation energy for films deposited at different substrate temperatures has been studied. The transmission spectra of the films are used to calculate the absorption coefficient and extinction coefficients and Optical band gaps of ZnGa_2Se_4 thin films deposited onto glass substrates at various substrate temperatures were investigated. The Schottky barrier diode by flash evaporation of ZnGa_2Se_4 onto pre-deposited film of aluminium with a native oxide layer is fabricated and barrier height of the device was measured using standard current-voltage and capacitance-voltage characteristics are discussed.

Resistive switching and memory effects have been studied on amorphous ZnGa_2Se_4 thin films. The I-V characteristics and electric pulse induced resistance change of Pt/ ZnGa_2Se_4 /Pyrographite/Pt sandwich memory device is measured. Retention behaviour of the memory device confirmed for its use as a non-volatile resistance memory device.
