



Contribution ID: 405

Type: **Poster Presentation**

Characterization of Al_xGa_{1-x}As by FTIR Spectroscopy

Wednesday, 5 July 2017 17:10 (1h 50m)

The ternary semiconductor Al_xGa_{1-x}As alloy finds many applications in the electronics industry. With very nearly the same lattice constant as GaAs, it is used as a barrier material in GaAs based heterostructure devices, where the AlGaAs layer confines the electrons to a gallium arsenide region. An example of an AlGaAs/GaAs device is a quantum well infrared photodetector. Alloys are grown on GaAs by metalorganic vapour phase deposition, and different properties of the alloy can be obtained by varying the Al content in Al_xGa_{1-x}As. It is therefore important to characterize the alloy to establish its properties as a function of Al content.

A total of 5 Al_xGa_{1-x}As samples with different Al contents were characterized by Fourier Transform Infrared spectroscopy (FTIR) in the reflectance mode. A Bruker 80V FTIR/Raman system, fitted with a horizontal stage sample holder, enabling near-normal incidence of incident radiation, was used to measure the reflectance of the samples. 50 Scans of each sample were obtained at a resolution of 8 cm⁻¹ and all measurements were done under vacuum. Layer thicknesses could be calculated from interference fringes in the reflectance spectra of the various samples. The results thus obtained by FTIR were compared to scanning electron microscopy (SEM) analyses. Preliminary results indicated that the layer thicknesses varied between 3.2 and 6.1 micron, which are in agreement with values supplied by the epilayer crystal growers. Results will be presented and discussed.

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

No

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

N/A

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

No

Primary author: Dr HASHE, Nobom (Nelson Mandela Metropolitan University)

Co-authors: Mr MINNAAR, Ettienne (Nelson Mandela Metropolitan University); Mr GOOSEN, William (Nelson Mandela Metropolitan University)

Presenter: Dr HASHE, Nobom (Nelson Mandela Metropolitan University)

Session Classification: Poster Session 2

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