

# **EFFECT OF HYDROGENATION ON RAMAN SPECTRA, STRUCTURAL AND OPTICAL PROPERTIES OF Mg/Al THIN FILMS**

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## **ABSTRACT**

The bilayer thin films of Mg/Al (400nm) were prepared in a vacuum system at pressure  $10^{-5}$  torr. Structural, optical properties and Raman spectra of Mg/Al thin films are investigated before and after exposure to hydrogen. Hydrogenation of annealed thin films has been performed by keeping these in hydrogenation cell at different hydrogen pressures for 30 minutes. The UV-Vis absorption spectra of thin films have been carried out at room temperature in the wavelength range of 300–900 nm. The optical band gap was found to be increase with hydrogen pressure.

We have observed decrease and increase intensity of peaks in Raman spectra with hydrogen pressure. Increase in intensity of Raman peak may be due to phase transformation or formation of complex hydrides. The enhanced hydrogen affinity and formation of complex hydrides in thin films might give valuable information for the use of these bilayer thin film structures for hydrogen storage purposes. We have correlate decrease in peaks with molecular hydrogen absorption at interface of film and sharp intense due to covalently bonded hydrogen in Mg/Al bilayer film. The XRD confirm the hexagonal structure of thin films with increasing concentration of hydrogen.

**KEYWORDS:** Bilayer Thin Films, Xrd, Optical, Electrical, Structural Properties and Raman Spectra