Contribution ID: **448** Type: **Poster Presentation**

Low temperature deposition of silicon nitride thin films by hot-wire CVD

Tuesday, 10 July 2012 17:30 (2 hours)

Abstract content
   (Max 300 words)

Amorphous silicon nitride (a-Si:N:H) is known for its superior transmission in the visible range and its tuneable optical band gap, which makes it a suitable candidate for anti-reflective coatings in photovoltaic applications. Plasma-enhanced chemical vapour deposition (PECVD) is currently the industrial workhorse for a-Si:N:H thin films. However, hot-wire CVD (HWCVD) provides an alternative to PECVD in that it allows for high deposition rates, no ion damage, reduction in cost and ease of up-scaling. This contribution reports on the effect of the ammonia gas (NH3) flow rate on the structural and optical properties of a-Si:N:H thin films deposited by HWCVD at low temperatures. Fourier transform infrared spectroscopy reveal that the resultant thin films are non-stoichiometric and silicon-rich (nitrogen deficient), as deduced from the absence of the N-H stretching mode at 3340 cm-1. Furthermore, a reduction in the deposition rate is observed with an increase in the NH3 flow rate, as estimated from the effective-medium approximation simulation of the UV-visible spectra, with its maximum value at 1 nm/sec. The effect of the hydrogen content on the structural integrity of the thin films is also discussed.

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

Yes

Level for award
 (Hons, MSc,
   PhD)?

MSc

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

Prof. Christopher Arendse, email: cjarendse@uwc.ac.za, Department of Physics, University of the Western Cape

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

Yes

Primary author: Mr ADAMS, Abdulghaaliq (Department of Physics, University of the Western Cape)

Co-authors: Prof. ARENDSE, Christopher (Department of Physics, University of the Western Cape); Dr MALGAS, Gerald (Council for Scientific and Industrial Research); Dr MULLER, Theophillus (Department of Physics, University of the Western Cape)

Presenter: Mr ADAMS, Abdulghaaliq (Department of Physics, University of the Western Cape)

Session Classification: Poster Session

Track Classification: Track F - Applied Physics