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

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## Abstract content <br/> &nbsp; (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 < br > consider for a student < br > &nbsp; award (Yes / No)?

Yes

Level for award<br/>
-&nbsp;(Hons, MSc, <br>
-&nbsp; PhD)?

MSc

## Main supervisor (name and email)<br/> sand his / her institution

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

Yes

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