

2010 Departmental Seminar

Tuesday, 16 February 2010

11.00 am

Mechanical Engineering Seminar Room – E547

Characterisation of step coverage by pulsed-pressure metalorganic chemical vapour deposition: Titanium dioxide thin films on 3D micro- and nano-scale structures

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Abstract:

Conformal step coverage is an important goal in the deposition of thin films for many industrial usages including microelectronics, integrated circuit technologies, and nanoimprint lithography. Most of the cases, the sizes of the trenches and vias tend to decrease but the aspect ratios tend to increase. Theoretically, a uniform thin film can be deposited on a desired 3D shape mould by balancing the deposition kinetics, physical adsorption, surface diffusion and crystal growth. Conformal thin films have been achieved using low pressure and self-saturated process such as low pressure chemical vapour deposition (LPCVD) and atomic layer deposition (ALD). Pulsed-pressure metalorganic chemical vapour deposition (PP-MOCVD) has the pulsing action with the potential to provide good uniformity in films with even step coverage.

Influences of deposition parameters on conformality, growth rate, surface morphology, phase, and water contact angle were investigated for the deposition of thin TiO₂ on silicon and silicon nitride substrates with 3D featured by PP-MOCVD. This talk will present the results of step coverage characterisation with a derived statistical conformality measurement.