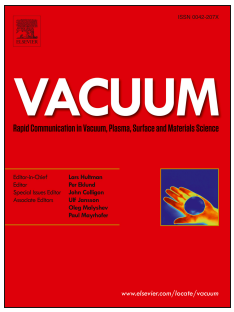
Accepted Manuscript



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PII: S0042-207X(18)30387-7

DOI: 10.1016/j.vacuum.2018.05.042

Reference: VAC 8005

To appear in: *Vacuum*

Received Date: 12 March 2018

Revised Date: 22 May 2018

Accepted Date: 23 May 2018

Please cite this article as: Hui San L, Sha Shiong N, Fong Kwong Y, Sol–gel spin coating growth of magnesium-doped indium nitride thin films, *Vacuum* (2018), doi: 10.1016/j.vacuum.2018.05.042.

Sol–gel spin coating growth of magnesium-doped indium nitride thin films

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Keywords: Doped indium nitride; Sol–gel spin coating; Nitridation process; Local vibration mode

A B S T R A C T

We report on sol–gel spin coating growth of magnesium (Mg)-doped indium nitride (InN) thin films with different Mg concentrations (i.e., 0%–4%). Polycrystalline films with wurtzite structure and preferred orientation of InN (101) are obtained. Field emission scanning electron microscope results reveal that InN thin films doped with 2% Mg exhibit hexagonal symmetry grains. The elemental composition analysis demonstrates that all samples are formed with approximately 1:1 atomic percentage ratio of indium to nitrogen. With regard to Raman measurements, a weak local vibration mode of Mg–N is detected at 562 cm^{-1}. This condition implies that Mg atoms are successfully incorporated into InN. Hall Effect measurements show that InN films doped with 1% and 2% Mg exhibit p-type conductivity, and the other samples show n-type conductivity. These results suggest that the low-cost sol–gel spin coating can be a potential method to synthesize p-type InN films.