

Accepted Manuscript

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

Lee Hui San, Ng Sha Shiong, Yam Fong Kwong

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

DOI: [10.1016/j.vacuum.2018.05.042](https://doi.org/10.1016/j.vacuum.2018.05.042)

Reference: VAC 8005

To appear in: *Vacuum*

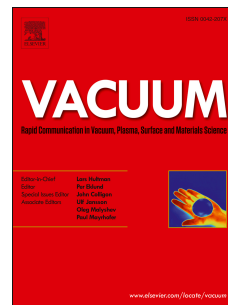
Received Date: 12 March 2018

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.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Sol–gel spin coating growth of magnesium-doped indium nitride thin films**Hui San, Lee^{1,2}, Sha Shiong, Ng^{1,*}, Fong Kwong, Yam²**¹Institute of Nano Optoelectronics Research and Technology (INOR),

Universiti Sains Malaysia, 11800, USM, Penang, Malaysia

²School of Physics, Universiti Sains Malaysia, 11800, USM, Penang, Malaysia.

Corresponding author: shashiong@yahoo.com

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.

Download English Version:

<https://daneshyari.com/en/article/8044085>

Download Persian Version:

<https://daneshyari.com/article/8044085>

[Daneshyari.com](https://daneshyari.com)