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**The influence of O<sub>2</sub> on the properties of InN thin films** A. DIXIT, C. SUDAKAR, J.S. THAKUR, Department of Physics and Astronomy Wayne State University, V.M. NAIK, Department of Natural Sciences University of Michigan-Dearborn, R. NAIK, G. LAWES, Department of Physics and Astronomy Wayne State University — InN thin films often exhibit characteristics typical of degenerate semiconductors. This degenerate behavior is typically attributed to the inclusion of oxygen vacancies or the presence of structural defects. To help clarify this point, we studied the effect of O<sub>2</sub> in two different sputter deposited InN thin films. One film was prepared using pure In metal sputtered in an argon/nitrogen atmosphere and the other sample was prepared from an In<sub>2</sub>O<sub>3</sub> target, which leads to incorporation of some oxygen in the resultant film. We studied the structural, optical and electronic properties of these films in detail. These measurements showed that even the small amount of O<sub>2</sub> from the oxide target, drastically affects the growth and structure of the InN film, resulting in polycrystalline samples. However, for both samples, the absorption spectra showed an optical band edge close to 1.84 eV with carrier concentration is  $\sim 10^{21} \text{ cm}^{-3}$ , showing the degenerate nature of both films. This study suggests that the degenerate nature of the InN films is unchanged on increasing the concentration of oxygen impurities or adding structural defects.

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