

Growth Temperature Dependence of Sol-gel Spin Coated Indium Nitride Thin Films

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The study highlights on the effects of growth temperatures on the properties of indium nitride (InN) thin films prepared by sol-gel spin coating method, followed by nitridation process at temperature ranging from 500 to 650 °C. The entire growth process was studied in depth. X-ray diffraction measurement revealed that the 600 °C has promoted the growth of wurtzite InN thin films, by which the closely packed InN grains were formed. The phenomena of thermal decomposition of InN and formation of metallic indium can be seen at 650 °C. Besides, the presence of compressive and tensile strains in the deposited films were revealed. The infrared (IR) reflectance measurement identified that the occurrence of strain has led to the shifting in transverse and longitudinal-optical phonon modes of the InN structure. The findings deduce that the optimal temperature for the crystal growth of InN is 600 °C.

Keywords: Indium nitride, sol-gel spin coating, nitridation, growth temperature, characterizations.