A116

Comparative Study of Gas Ratio on Indium Nitride Thin Films Grown on Flexible Substrates Prepared by Reactive Sputtering Method.

SITI AISYAH Osman[1, a *], and NG Sha Shiong[1,b]

[1]Institute of Nano Optoelectonic Research and technology (INOR), Universiti Sains Malaysia, 11800 USM, Penang, Malaysia

[a]sitiaisyahosman@gmail.com, [b]shashiong@usm.my

In this report, indium nitride thin films were deposited on kapton polyimide flexible substrate by reactive radio frequency (RF) sputtering method using an indium target in a mixture of Ar and N_2 gases. The InN thin films were deposited under different gas ratio, i.e 90:10, 80:20, 70:30 and 60:40 of N_2:Ar. The crystalline structures, surface morphologies, elemental composition and electrical properties of the deposited films were characterized by X-ray diffraction, field-emission scanning electron microscopy, atomic force microscopy, energy dispersive spectroscopy and hall effect. The X-ray diffraction revealed wurtzite polycrystalline with hexagonal InN (002), (101), (102), (103) and (201) preferred growth orientation. The morphologies showed smooth and uniform surface of gas ratio at 60:40 compare to others gas ratio. In overall, the characteristics of the InN thin films were effectively improved with combination the N_2:Ar gas ration at 60:40. The results showed that the gas ratio plays an important role in improving the properties of the InN thin films.

Keywords: Indium nitride, flexible substrate, radio frequency sputtering, gas ratio