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Growth of Mg-doped InN by Metal Organic Chemical Vapor Deposition N. KHAN, N. NEPAL, J.Y. LIN, H.X. JIANG, Kansas State University — InN with an energy gap of ~ 0.7 eV, has recently attracted extensive attention due to its potential applications in semiconductor devices such as light emitting diodes, lasers, and high efficiency solar cells. However the ability to grow both p-type and n-type InN is essential to realize these devices. All as grown unintentionally doped InN are n-type. The tendency of native defects in InN to form donors manifests itself severely at surfaces where high levels of electron accumulation are observed. The highly n-type conductive layer at the surface of InN films creates difficulties in the demonstration of p-type InN. Nevertheless it is important to investigate the optical and structural properties of Mg-doped InN. We report here on the growth of Mg-doped InN epilayers by metal organic chemical vapor deposition. Photoluminescence (PL) was employed to study the effects of different growth conditions of Mg-doped InN. PL studies revealed that in addition to emission peak at ~ 0.82 eV in undoped InN layers, Mg-doped InN layers exhibit an emission peak at ~ 0.75 eV. The peak at ~ 0.75eV for Mg-doped InN could be related to defects generated by Mg doping in InN. Various other measurements such as Hall effect measurement, X-ray diffraction and atomic force microscopy were carried out to provide further understanding.

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