

## D2

# EFFECTS OF DIFFERENT GROWTH TEMPERATURES TOWARDS INDIUM COMPOSITION AND PERFORMANCE OF INGAN QUANTUM WELL HETEROSTRUCTURE

Muhd Azi Che Seliman<sup>1</sup>, Zainuriah Hassan<sup>1\*</sup>, Ahmad Sauffi Yusof<sup>1</sup>, Mohd Anas Ahmad<sup>1</sup>, Nur Atiqah Hamzah<sup>1</sup>, Rahil Izzati Mohd Asri<sup>1</sup>, Mohd Syamsul Nasyriq Samsol Baharin<sup>1</sup>

<sup>1</sup>*Institute of Nano Optoelectronics Research and Technology (INOR), Universiti Sains Malaysia, 11800 Penang, MALAYSIA.*

\*Corresponding Author: zai@usm.my

**ABSTRACT-** In the present work, InGaN quantum well (QW) and undoped GaN layer were grown on a flat sapphire substrate (FSS) with different growth temperatures using Metal Organic Chemical Vapor Phase Deposition (MOCVD) to investigate the effects of growth temperature towards indium (In) composition and performance of the heterostructure. According to photoluminescence (PL) measurement, within growth temperature of 750 °C to 850 °C, the range of emission wavelength achieved was 386 nm to 476 nm. While higher growth temperature led to shorter emission wavelength, In composition in the active region was affected as well due to decomposition of In at high temperature. Using quantitative phase analysis of High Resolution X-Ray Diffraction System (HRXRD), measurement of In composition was conducted to further study the structural properties of the structure and conclude the optimization of InGaN QW layer.

**Keywords:** InGaN, Indium composition, Metal organic chemical vapor phase deposition (MOCVD), Photoluminescence (PL), High resolution X-Ray diffraction (HRXRD).