A169

Fabrication of InxGa1-xN/GaN Multi-Quantum Well Structure for Green Light Emitting Diode on Patterned Sapphire Substrate by Metal Organic Chemical Vapour Deposition

Shamsul Amir Abdul Rais[1], Hayatun Najiha[2], Zainuriah Hassan[1], Ahmad Shuhaimi[2]

[1]Institute of Nano Optoelectronics Research and Technology (INOR), Universiti Sains Malaysia, 11800 Penang, Malaysia

[2]Department of Physics, Low Dimensional Materials Research Centre (LDMRC), University of Malaya, 50603 Kuala Lumpur, Malaysia

Email: shamsulamir@unimap.edu.my

In an effort to successfully fabricate InGaN-based for green emitting devices on patterned sapphire substrate, the indium composition in $In_xGa_{1-x}N$/GaN multi-quantum well structure is crucial because lower indium composition will shift the wavelength towards ultraviolet region. In this study, 4 micrometre of undoped GaN epilayer was deposited as a buffer layer prior to the growth structure. In order to complete the device, 6 pairs of InGaN/GaN multi-quantum well structure was sandwiched with a 500 nm of p-GaN layer and 300 nm of n-GaN layer by metal organic chemical vapour deposition (MOCVD). In this research, the indium to gallium composition ratio was 4:1. The crystal and optical properties of the samples were characterized using field effect scanning electron microscopy, high resolution x-ray diffraction spectroscopy, and photoluminescence spectroscopy.

Keywords: Green emission, Multi-Quantum Well, Light Emitting Diode, MOCVD