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MOCVD를 이용하여 sapphire(0001)에 성장한 Al 함량에 따른 AlGaN/GaN의 특성
Properties of AlGaN/GaN as Al contents grown on sapphire(0001) by MOCVD

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The $Al_xGa_{1-x}N/GaN$ structures were fabricated by metal-organic chemical vapor deposition AlGaN layers are known to be the most promising for UV devices by virtue of their direct bandgap tenability from 3 4 to 6 2eV Several groups have reported that the biaxial tensile strain generated on AlGaN layer was strongly related to the Al alloy composition in AlGaN/GaN structures

AlGaN/GaN has demonstrated excellent device characteristics, which make them excellent candidates for high temperature, high power, high frequency, and low noise applications The nature of tensile strain AlGaN layer, however, tends to defects or cracks which severely deteriorate the operating properties of the devices To avoid cracks formation, many activities have stressed upon low Al content $Al_xGa_{1-x}N$ films to minimize the mismatch between AlGaN and GaN with only limited efforts on the study of high Al content $Al_xGa_{1-x}N$ films and related heterostructures

PL and AFM measurements were performed at room temperature using the He-Cd laser excitation and surface roughness, respectively As Al mole fraction increases, the values of the root mean square (RMS) grew gradually higher