Si(111) 위에 Ion beam 처리 후 AlN layer를 완충층으로 이용하여 성장시킨 GaN의 특성
(The characteristics of AlN buffered GaN on ion beam modified Si(111) substrates)

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The growth of GaN on Si is of great interest due to the several advantages: low cost, large size and high-quality wafer availability as well as its matured technology. The crystal quality of GaN is known to be much influenced by the surface pretreatment of Si substrate[1]. In this work, the properties of GaN overlayer grown on ion beam modified Si(111) have been investigated. Si(111) surface was treated RIB with 1KeV-N$_2$ (at 1.9×10$^5$) to dose ranging from 5×10$^{15}$ to 1×10$^{17}$ prior to film growth. GaN epilayers were grown at 1100℃ for 1 hour after growing AlN buffer layers for 5~30 minutes at 1100℃ in Metal Organic Chemical Vapor Deposition (MOCVD). The properties of GaN epilayers were evaluated by X-Ray Diffraction (XRD), Raman spectroscopy, Photoluminescence (PL) and Hall measurement. The results showed that the ion modified treatment markedly affected to the structural, optical and electrical characteristic of GaN layers.

![XRD peak of AlN buffer layer depending on NH$_3$ flow rate](image)

Fig.1. XRD peak of AlN buffer layer depending on NH$_3$ flow rate