

Properties of GaN Epitaxial Films on Silicon Substrates Grown by MHVPE (Modified Hydride Vapor Phase Epitaxy) and Seed-solution Method

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In this study, Gallium Nitride (GaN) films are deposited on silicon substrates by applying MHVPE and seed-solution method. The GaN seed layer is formed on silicon substrate through spin-coating and nitridation process prior to the growth of GaN epi-layer. Temperature for both nitridation and deposition process is fixed at 850°C. Tris N,N-dimethyldithiocarbamate gallium (III) (Ga(mDTC)3) is used as precursor for the formation of GaN seed-layer. The surface morphology of the GaN films is observed by Scanning Electron Microscopy (SEM-Hitachi S4100). Structure of the GaN films observed by X-Ray Diffraction (XRD) is hexagonal structure with (0002) preferred orientation. Photoluminescence (PL) with He-Cd laser source (wavelength 325 nm) shows that value of the GaN film band gap is about 3.4 eV.

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