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Surface morphology evolution of GaN thin films directly grown on c-plane sapphire substrate by hydride vapor phase epitaxy SANG-HWA LEE, HYEOKMIN CHOE, TAEGEON OH, BOA SHIN, JAEWON JEON, CHINKYO KIM, Kyunghee University — Epitaxial GaN thin films were grown with no *intentional* buffer layers at 1050 ° on c-plane sapphire substrates by hydride vapor phase epitaxy. Scanning electron microscopy (SEM), synchrotron x-ray scattering, and transmission electron microscopy (TEM) were utilized to investigate the nucleation mechanism and the evolution of surface morphology. It turned out that unintentional buffer layers accomodating lattice mismatch between GaN and sapphire substrate were spontaneously formed. The surface morhologies of subsequently grown layers showed very different characteristics which were not observed in typical two step growth of GaN films.

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