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Lattice Parameter Variation in ScGaN Alloy Thin Films on MgO(001) Grown by RF Plasma Molecular Beam Epitaxy ARTHUR SMITH, Ohio University, COSTEL CONSTANTIN, Seton Hall University, JEONGIHM PAK, KANGKANG WANG, ABHIJIT CHINCHORE, MENG SHI, Ohio University — We present the structural and surface characterization of the alloy formation of scandium gallium nitride $Sc_xGa_{1-x}N(001)/MgO(001)$ grown by radio-frequency molecular beam epitaxy over the Sc range of x = 0-100%. In-plane diffraction measurements show a clear face-centered cubic surface structure with single-crystalline epitaxial type of growth mode for all x; a diffuse/distinct transition in the surface structure occurs at near x = 0.5. This is consistent with out-of-plane diffraction measurements which show a linear variation of perpendicular lattice constant $a_\perp$ for x = 0 to 0.5, after which $a_\perp$ becomes approximately constant. The x = 0.5 transition is interpreted as being related to the cross-over from zinc-blende to rock-salt structure. This work has been supported by DOE (Grant No.DE-FG02-06ER46317) and NSF (Grant No. 0304314). Equipment support from ONR is also acknowledged.

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