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Temperature Evolution of Gallium Nitride Nanowire Vapor-solid Growth Matrix K. MCELROY, Michigan State University, B.W. JACOBS, Sandia National Laboratories, CA, T.R. BIELER, M.A. CRIMP, V.M. AYRES, Michigan State University — Recent results indicate that vapor-solid growth mechanisms can yield semiconductor nanowires with high crystallinity. In the present experiments, gallium nitride nanowire growth is initiated following formation of a microcrystalline growth matrix. A change in nanowire orientation from wurtzite <2-1-10>/zinc-blende <011> directions at 850 $^\circ$C and 950 $^\circ$C to the wurtzite [0001] direction at 1000 $^\circ$C is observed. The change in nanowire orientation is correlated with changes in the growth matrix. Investigations of the evolution of the growth matrix as a function of temperature using x-ray diffraction with orientation analysis, atomic fore microscopy, high-resolution transmission electron microscopy (HRTEM) and scanning electron microscopy (SEM) are presented.

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