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Investigation of Magnetic Doping of High-Density GaN Nanorods[1] J.E. VAN NOSTRAND, Air Force Research Laboratory, J. BOECKL, Air Force Research Laboratory, Materials and Manufacturing Directorate, J.D. ALBRECHT, R. CORTEZ, Air Force Research Laboratory, Sensors Directorate, Wright-Patterson AFB, Ohio — We investigate GaN nanorods as host structures for transition metal doping and alloying. The epitaxial growth of bulk-like films of GaMnN, which has been predicted to exhibit ferromagnetism at or above 300K, has been the focus of many recent investigations. Epitaxial growth of GaMnN involves lowering the substrate temperature to allow the mobile Mn to incorporate while sacrificing the underlying GaN crystal quality. This delicate balance is difficult to achieve, and with increasing Mn flux the GaMnN often contains magnetic precipitates or serious structural inhomogeneities. We investigate the layers of vertical GaN nanorods having a width of 60±5 nm which were grown by MBE on Al_2O_3(0001) and Si(111) substrates. These rods appear to be fully-relaxed, low- defect structures which have PL with a narrow (2.05 Å FWHM) peak centered at 3572.6 Å. We report on nanorods with continuous Mn doping as well as Mn doped GaMnN/InGaN quantum wells incorporated into the nanorods.

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