

Abstract Submitted
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Properties of the LO-Phonon in GaN Nanocrystallites¹ LEAH BERGMAN, Department of Physics University of Idaho, ANDREW P. PURDY, US Naval Research Laboratory, Chemistry Division — Resonant Raman scattering in wurtzite structured GaN nanocrystallites of various morphologies were studied. The LO polar mode exhibited Fröhlich-type resonant Raman scattering whose characteristics were found to depend weakly on the morphology of the crystallites. In contrast, the UV-laser heating and heat retention in the porous media of a crystallite ensemble were discovered to drastically modify the Raman properties. An ensemble temperature on the order of 550 K was inferred from the electron-phonon interaction model, a result that was verified via Raman scattering experiments at the elevated temperature regime. Complementary photoluminescence investigations concur with the Raman findings. The LO behavior of the GaN nanocrystallites, at temperature range 77 K- 900 K was investigated as well; the behavior is discussed in terms of the anharmonic decay mechanisms and the phonon dispersion curve of GaN of the wurtzite structure

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