

## Semiconductors

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## Low-Dimensional Systems

Raman and infrared spectroscopy of GaN nanocrystals grown by chloride-hydride vapor-phase epitaxy on oxidized silicon

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**Abstract** Raman and infrared spectroscopy were applied to study nanocrystalline GaN films grown by chloride-hydride vapor-phase epitaxy on SiO<sub>2</sub>/Si(111) substrates at  $T=520^{\circ}\text{C}$ . It was ascertained that GaN nanocrystals are formed on the oxidized silicon surface at a rate of  $10^{-2}$  nm/s. It was shown that the peaks in the Raman spectra  $E_2(\text{high})=566\text{ cm}^{-1}$  and  $A_1(\text{LO})=730\text{ cm}^{-1}$  correspond to the elastically strained GaN wurtzite structure. It was detected that a peak related to  $E_1(\text{TO})=558\text{ cm}^{-1}$  arises in the infrared spectra, which shows that elastic stresses in the nanocrystals are insignificant.

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