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Phonon modes in Ga(As,N)

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Isoelectronic N doping in GaAs has recently become an important subject in search for a new semiconducting material, whose direct bandgap is located between 0.8 and 1.0 eV. Heavy N doping in GaAs up to a few atomic percent results in the so-called *giant bandgap reduction* from the GaAs bandgap.¹ Phonons in Ga(As,N) have been probed extensively using Raman spectroscopy, infrared absorption, and ellipsometry;² playing an key role in studying the electronic properties as well as the vibrational properties in Ga(As,N). Nonetheless, there exist few reports on the theoretical investigations on the vibrational properties of Ga(As,N). In this poster, we investigate the phonon mode behavior of ternary Ga(As,N) semiconductor. Ga(As,N) ternary semiconductors yield to the two mode behavior like AlGaAs, while column-III-nitride semiconductors, such as (Ga,Al)N and (In,Ga)N, show one mode behavior.³ The underlying mechanism for these behaviors will be explained in this poster.

[참고문헌]

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