EVTODIEV, Silvia, CARAMAN, Iu., DMITROGLO, Liliana et al. Optical Properties of III–VI Lamellar Semiconductors Doped with Cu and Cd and of Related III–VI/Native Oxide Structures . In: Journal of Nanoelectronics and Optoelectronics. 2011, Vol. 6, nr. 4, pp. 502-513. ISSN 1555-130X.

GaS, GaSe and GaTe are typical representatives of III–VI layered semiconductor materials, showing highly anisotropic mechanical and optical properties. At photon energies $h\nu < E_g$, the anisotropy ratio for the absorption coefficients at the $n = 1$ excitonic peak, corresponding to $E \rightarrow C \rightarrow$ and $E \rightarrow \perp C \rightarrow$ polarizations, is $\alpha_{\parallel} / \alpha_{\perp} \approx 15$. Optical functions $n_e(\lambda)$ and $n_o(\lambda)$ of GaS and GaSe in the wavelength range 0.36–22 μm have been determined. For the photon energies $h\nu < E_g^{ind}$, these correspond to a normal dispersion and can be described by power-law wavelength dependences. By means of FTIR transmission and reflection spectroscopy in the spectral range of 1000–85 cm^{-1}, for plan-parallel plates with thickness between several tens of nanometers and centimeters, the wavenumbers of longitudinal optical ν(LO) and transverse optical ν(TO) phonons have been determined for GaSe [$\nu_{\perp}$(LO) = 254 cm^{-1}, $\nu_{\perp}$(TO) = 214 cm^{-1}], GaS [$\nu_{\perp}$(LO) = 359 cm^{-1}, $\nu_{\perp}$(TO) = 297 cm^{-1}, $\nu_{\parallel}$ (LO) = 336 cm^{-1}], and GaTe [ν(LO) = 164 cm^{-1}, ν(TO) = 118 cm^{-1}].