



Birefringence of $\text{Cu}_2\text{ZnSiSe}_4$ single crystals

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Abstract

In $\text{Cu}_2\text{ZnSiSe}_4$ single crystals an interference spectra of the Fabry–Perot type due to observed birefringence were studied and spectral dependence of the refractive index $n_{||}$ ($E||c$) and n_{\perp} ($E\perp c$), which intersect at isotropic wavelength $\lambda_0=622\text{nm}$ (300K) and 605nm (10K) were defined. The spectral dependence of $\Delta n=n_{\perp}-n_{||}$ in the short-wave and long-wave side of the wavelength λ_0 was determined. It was found that when $\lambda>\lambda_0$ Δn is negative and when $\lambda<\lambda_0$ Δn is positive. Wavelength λ_0 shifts as the temperature decreases toward shorter wavelengths. Phases of the $n_{||}$ and n_{\perp} light waves in $\lambda>\lambda_0$ and $\lambda<\lambda_0$ are different. At a wavelength of 538nm (10K) Δn has a maximum. Absorption coefficient in the fringes varies up to 10^2-10^3 times.