



# Optical properties and birefringence of ZnIn<sub>2</sub>S<sub>4</sub> layered crystals

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## Abstract

Interference spectra of layered ZnIn<sub>2</sub>S<sub>4</sub> crystals were investigated for samples of different thicknesses (7.5–900 μm). Spectral dependences of refractive indices ( $n^a$  and  $n^b$ ) for light waves with different polarizations were calculated and their intersection observed at energy  $E_o \sim 2.38$  eV. The refractive indices difference ( $\Delta n = n^a - n^b$ ) was determined at energy range 0.8–3.0 eV. Features observed in reflection and absorption spectra were attributed to the band-to-band electron transitions at  $k = 0$ . Magnitudes of valence bands ( $V_1, V_2$  and  $V_3, V_4$ ) splitting due to crystal field and spin–orbital interaction were determined. Electron transitions in energy interval 2–6 eV were identified on the basis of available theoretical band structure calculations.

*Keywords: interference spectra, birefringence, Frenkel excitons, refractive indices, bands structure*

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