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PHASE BIREFRINGENCE DISPERSION FUNCTION AS A COMPLEMENTARY TOOL FOR INVESTIGATION OF NEMATIC LIQUID CRYSTAL STRUCTURE

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If we put a several tens of microns thin sample of nematic liquid crystal with planar alignment of molecules with respect to the LC cell surface in between two crossed plane polarizers, illuminate it by white light and rotate appropriately, then using a fiber optic spectrometer we can observe a quasi-periodic spectral distribution of intensity of light behind the output polarizer. The spectral distribution of intensity of light emerges due to liquid crystal birefringence. Based on the polarizability models from which imply models describing the extraordinary and ordinary refractive indices n e a n o , respectively, the phase birefringence dispersion function of LC in the spectral region of wavelengths without resonant frequencies can be expressed. Comparison of the measured spectrum with that obtained by calculation according to the model one can find parameters characterizing mean resonance (absorption) wavelengths as well as coefficients expressing the strength of the influence of these absorption bands to resulting birefringence. The approach could complement absorption or ellipsometric measurements the aim of which was to characterize optical properties of a liquid crystal sample.

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