

OPTICAL POLARIZATION INVESTIGATIONS
OF CHOLESTERIC BLUE PHASES

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S u m m a r y

The simultaneous measurements of azimuth and ellipticity of the polarization ellipse of originally linearly-polarized light after transmission through monocrystalline and polycrystalline samples of blue phases are performed for the first time. It is shown that, in the entire temperature region of the blue phase existence including the region of supercooling, both circular and small linear birefringences exist. Various possible mechanisms of linear birefringence which do not contradict the cubic arrangement of defects in the blue phase, among which spatial dispersion of higher orders and a possibility of existence of a surface-induced anisotropic layer, are discussed. It is shown that, both in theoretical and experimental investigations of optical activity of blue phases, it has to be taken into account that eigenwaves of this medium are circular only for certain directions which coincide with rotational axes of the fourth and third orders, and the eigenwaves are elliptic for all other directions.