

# The electric and magnetic modification of the chirality of the $\varepsilon$ -isotropic crystals

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The phenomenological theory of the effect of an external electric and magnetic field on the light wave propagation in tetragonal chiral crystals with crossed dispersion curves of the main values of the permittivity tensor is advanced. The theory is based on the Onsager - Casimir principle in the following formulation:

$$\tilde{K}(\mathbf{e}, \mathbf{h}) = TK(\mathbf{e}, -\mathbf{h})T^{-1}$$

Here

$$K(\mathbf{e}, \mathbf{h}) = \begin{pmatrix} \varepsilon(\mathbf{e}, \mathbf{h}) & \alpha(\mathbf{e}, \mathbf{h}) \\ b(\mathbf{e}, \mathbf{h}) & \mu(\mathbf{e}, \mathbf{h}) \end{pmatrix}$$

is the  $6 \times 6$ -matrix of constants in constitutive equations

$$\mathbf{D} = \varepsilon\mathbf{E} + \alpha\mathbf{H}, \quad \mathbf{B} = b\mathbf{E} + \mu\mathbf{H}$$

of electrodynamics of bi-anisotropic media,  $\mathbf{e}$  and  $\mathbf{h}$  are the vectors of external electric and magnetic fields respectively,

$$T = T^{-1} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

is the  $6 \times 6$  -matrix of time inversion for electromagnetic field.