

# Properties of Thermotropic Nematic Liquid Crystal C7

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Thermotropic biaxial nematic is a promising liquid crystal (LC) phase for application in the fast switching electro-optical devices.<sup>1</sup> In contrast to the conventional uniaxial nematics, the biaxial nematic LCs have three mutually perpendicular directions with distinguishable physical properties.<sup>2,3</sup> The existence of the biaxial phase has been recently demonstrated for the thermotropic LC material 4,4'(1,3,4-oxadiazole-2,5-diyl) di-*p*-heptylbenzoate<sup>4-7</sup> (C7) with boomerang-like molecules.

In the present work, we study the optical and dielectric properties of the nematic phase of C7 in well-aligned “monocrystalline” states. The experimental results show unusual optical and dielectric properties of studied material and its response to the electric field at different temperatures, such as high dielectric permittivity values and increasing of relaxation time with increasing the temperature. The used complex experimental setup provides the possibility of simultaneous detailed measurements of the optical, dielectric and switching properties depending on temperature and other parameters. In addition, we analyze defectuous structures formed by C7 in different confinement geometries.

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