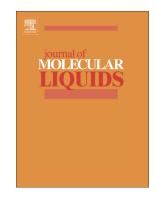
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ACCEPTED MANUSCRIPT

Graphene-induced bi-tilted two-component smectic C_G phase with bulk

ferroelectricity in hydrogen-bonded dimer liquid crystals

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Abstract

Nanocomposites of the hydrogen-bonded dimeric liquid crystal heptyloxybenzoic acid (70BA) with admixture of graphene flakes (GFs) are investigated with microtexture polarization analysis for new effects in their electro-optical behavior and characterized with Raman spectroscopy. In the nanocomposite with GF concentration of $3x10^{-4}$ wt% we establish as lowest-temperature LC state the triclinic smectic C_G phase featuring chirality and ferroelectricity, previously found only in 70BA nanocomposites with carbon nanotubes and in large banana-like bent-core molecules even though pure 70BA is typically achiral. In the present study we find the C_G phase manifested as two detached sub-structures with a smooth transition between them. For the appearance of the C_G phase with its substructures denoted as C_{Gcl} and C_{Gln} we propose an explanation based on the π - π interaction of the 70BA

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