

Accepted Manuscript

Graphene-induced bi-tilted two-component smectic CG phase with bulk ferroelectricity in hydrogen-bonded dimer liquid crystals

Minko Petrov, Peter M. Rafailov, Haritun Naradikian, Boyko Katranchev, Neno Todorov



PII: S0167-7322(18)33073-3
DOI: [doi:10.1016/j.molliq.2018.09.030](https://doi.org/10.1016/j.molliq.2018.09.030)
Reference: MOLLIQ 9636
To appear in: *Journal of Molecular Liquids*
Received date: 14 June 2018
Revised date: 7 August 2018
Accepted date: 6 September 2018

Please cite this article as: Minko Petrov, Peter M. Rafailov, Haritun Naradikian, Boyko Katranchev, Neno Todorov , Graphene-induced bi-tilted two-component smectic CG phase with bulk ferroelectricity in hydrogen-bonded dimer liquid crystals. Molliq (2018), doi:[10.1016/j.molliq.2018.09.030](https://doi.org/10.1016/j.molliq.2018.09.030)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Graphene-induced bi-tilted two-component smectic C_G phase with bulk ferroelectricity in hydrogen-bonded dimer liquid crystals

Minko Petrov^{1*}, Peter M. Rafailov¹, Haritun Naradikian¹, Boyko Katranchev¹ and Neno Todorov²

¹Institute of Solid State Physics, Bulgarian Academy of Science, 72 Tzarigradsko Chausse Blvd., 1784 Sofia, Bulgaria

²Faculty of Physics, University of Sofia "St. Kl. Ohridski", 5 James Bourchier Boulevard, 1164 Sofia, Bulgaria

Email: Minko Petrov – mpetrov@issp.bas.bg

* Corresponding author

Abstract

Nanocomposites of the hydrogen-bonded dimeric liquid crystal heptyloxybenzoic acid (7OBA) 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 3×10^{-4} wt% we establish as lowest-temperature LC state the triclinic smectic C_G phase featuring chirality and ferroelectricity, previously found only in 7OBA nanocomposites with carbon nanotubes and in large banana-like bent-core molecules even though pure 7OBA 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 7OBA

Download English Version:

<https://daneshyari.com/en/article/10155122>

Download Persian Version:

<https://daneshyari.com/article/10155122>

[Daneshyari.com](https://daneshyari.com)