

Accepted Manuscript

Dependence of physical parameters on the size of silver nano particles forming composites with a nematic liquid crystalline material

Pratibha Tripathi, Mukesh Mishra, Sandeep Kumar, Roman Dabrowski, Ravindra Dhar



PII: S0167-7322(18)30409-4
DOI: doi:[10.1016/j.molliq.2018.07.046](https://doi.org/10.1016/j.molliq.2018.07.046)
Reference: MOLLIQ 9367
To appear in: *Journal of Molecular Liquids*
Received date: 25 January 2018
Revised date: 10 July 2018
Accepted date: 11 July 2018

Please cite this article as: Pratibha Tripathi, Mukesh Mishra, Sandeep Kumar, Roman Dabrowski, Ravindra Dhar , Dependence of physical parameters on the size of silver nano particles forming composites with a nematic liquid crystalline material. Molliq (2018), doi:[10.1016/j.molliq.2018.07.046](https://doi.org/10.1016/j.molliq.2018.07.046)

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.

Dependence of physical parameters on the size of silver nano particles forming composites with a nematic liquid crystalline material

Pratibha Tripathi^a, Mukesh Mishra^a, Sandeep Kumar^b, Roman Dabrowski^c and Ravindra Dhar^{a*}

^a*Centre of Material Sciences, Institute of Interdisciplinary Studies, University of Allahabad, Allahabad, India -211002.*

^b*Raman Research Institute, C.V. Raman Avenue, Sadashivanagar, Bangalore, India-560080.*

^c*Faculty of Advanced Technologies and Chemistry, Military University of Technology, Warsaw, Poland.*

Abstract

Thermodynamic, dielectric and electro-optical properties of a nematic liquid crystal namely 4-(trans-4-n-hexylcyclohexyl) isothiocyanatobenzoate (6CHBT) mixed with silver nanoparticles (Ag-NPs) of two widely different sizes have been studied. Thermodynamic studies suggest nominal increase in isotropic to nematic transition temperature of the nano composites as compared to the pure 6CHBT. Dielectric parameters of nano composites in the homeotropic and planar aligned samples have been measured in the frequency range of 1 Hz-35 MHz. Dielectric studies suggest that anisotropy is marginally decreased due to the dispersion of Ag-NPs. Threshold voltage for Freedericksz transition and splay elastic constant has decreased in the case of nano composites. Dielectric studies also suggest that relaxation mode corresponding to the molecular rotation about its long axis cannot be detected in the experimental window of the frequency. However, we obtained a relaxation mode due to the molecular rotation about its short axis.

Keywords: liquid crystal nano composites; dielectric permittivity; anisotropy; relaxation frequency, conductivity, threshold voltage, splay elastic constant

*Author for correspondence (email: dr.ravindra.dhar@gmail.com)

Download English Version:

<https://daneshyari.com/en/article/7841741>

Download Persian Version:

<https://daneshyari.com/article/7841741>

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