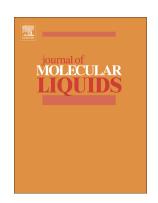
Accepted Manuscript

Investigation of thermodynamic properties of 4-decyloxybiphenyl-4'-carboxylic acid liquid crystal and preparation of polymer dispersed liquid crystal composite



Emine Öztürk, Hale Ocak, Fatih Cakar, Gürkan Karanlık, Özlem Cankurtaran, Belkis Bilgin-Eran

PII: S0167-7322(18)31086-9

DOI: doi:10.1016/j.molliq.2018.05.080

Reference: MOLLIQ 9135

To appear in: Journal of Molecular Liquids

Received date: 5 March 2018 Revised date: 16 May 2018 Accepted date: 19 May 2018

Please cite this article as: Emine Öztürk, Hale Ocak, Fatih Cakar, Gürkan Karanlık, Özlem Cankurtaran, Belkis Bilgin-Eran , Investigation of thermodynamic properties of 4-decyloxybiphenyl-4'-carboxylic acid liquid crystal and preparation of polymer dispersed liquid crystal composite. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2018.05.080

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.

ACCEPTED MANUSCRIPT

INVESTIGATION OF THERMODYNAMIC PROPERTIES OF 4-DECYLOXYBIPHENYL-4'-CARBOXYLIC ACID LIQUID CRYSTAL AND PREPARATION OF POLYMER DISPERSED LIQUID CRYSTAL COMPOSITE

Emine Öztürk, Hale Ocak, Fatih Cakar, Gürkan Karanlık, Özlem Cankurtaran*, Belkis Bilgin-Eran

Department of Chemistry, Yildiz Technical University, Istanbul, Turkey

ABSTRACT

In this study, firstly, retention behavior of solvents on the liquid crystalline material 4-decyloxybiphenyl-4'-carboxylic acid (DBCA) have been studied by inverse gas chromatography (IGC) technique. Liquid crystal (LC) selectivity was investigated using the acetate isomers by the IGC method at temperatures between 333.2 K and 543.2 K. Later on, the interactions of LC with n-octane, n-nonane, n-decane, undecane, dodecane, tridecane, n-propyl benzene, isopropyl benzene, ethylbenzene, chlorobenzene and toluene between 518.2 K and 543.2 K were examined. LC-solvent interaction parameters for Flory-Huggins theory, χ_{12}^{∞} , and equation of state theory, χ_{12}^{*} , effective exchange energy parameters, X_{eff} , the weight fraction activity coefficent, Ω_{1}^{∞} , the partial molar heat of mixing at infinite dilution of the solvent, ΔH_{1}^{∞} , molar heat of vaporization of solvent, ΔH_{V} and the partial molar heat of sorption of the solvent, $\Delta H_{1,s}$ were obtained.

Secondly, polymer dispersed liquid crystal (PDLC) composite film in composition 20/80 poly(methyl methacrylate) (PMMA):DBCA by weight was synthesized by solvent-induced phase separation method. The mesomorphic behaviour of DBCA and PDLC composite has been investigated by differential scanning calorimetry (DSC) and optical polarizing microscopy (PM).

Key words: Liquid crystal, Thermodynamic interaction parameters, Inverse gas chromatography, Poly(methyl methacrylate), Polymer dispersed liquid crystal composite

Download English Version:

https://daneshyari.com/en/article/7841771

Download Persian Version:

https://daneshyari.com/article/7841771

<u>Daneshyari.com</u>