Accepted Manuscript

Spectroscopic studies on the binary solutions of ethanol with 1,4-dioxane

N.K. Karthick, P.P. Kannan, A. Mahendraprabu, G. Arivazhagan, N. Suganya

PII: S0167-7322(16)31965-1

DOI: doi: 10.1016/j.molliq.2017.02.064

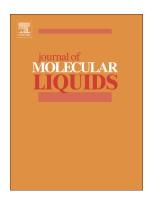
Reference: MOLLIO 6977

To appear in: Journal of Molecular Liquids

Received date: 19 July 2016 Revised date: 15 February 2017 Accepted date: 16 February 2017

Please cite this article as: N.K. Karthick, P.P. Kannan, A. Mahendraprabu, G. Arivazhagan, N. Suganya, Spectroscopic studies on the binary solutions of ethanol with 1,4-dioxane. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi: 10.1016/j.molliq.2017.02.064

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

Spectroscopic studies on the binary solutions of ethanol with 1,4- dioxane

N. K. Karthick^a, P. P. Kannan^a, A. Mahendraprabu^a, G. Arivazhagan^{a*}, N. Suganya^a

^aDepartment of Physics, Thiagarajar College, Madurai - 625009, Tamilnadu, India

Abstract

FTIR spectral measurements have been carried out on the binary solutions of ethanol with 1,4 - dioxane at the compositions 0.2:0.8, 0.4:0.6, 0.6:0.4, 0.8:0.2 (mole fraction of ethanol: mole fraction of 1,4- dioxane) at room temperature. There seems to be no change in the geometry of the open polymeric forms of ethanol in the presence of 1,4-dioxane. $(ethanol)O - H \cdots O(1,4-dioxane)$, $(ethanol methyl)C - H \cdots O(1,4-dioxane)$ and $(1,4-dioxane)C - H \cdots O(ethanol)$, and heterointeractions coexist in the binary solutions. In 1,4- dioxane rich solutions, the dissociation of ethanol molecules is the dominant effect than the $(ethanol)O - H \cdots O(1,4-dioxane)$ heterointeraction. All the heterointeractions are weakened in ethanol rich solutions where the ethanol molecules tend to attain their higher order multimerization through their self association. NMR and UV-vis spectroscopic studies have been carried out on the system ethanol + 1,4-dioxane. The change in the chemical shift positions of methylene and methyl carbon nuclei in the solution and the hyperchromism, bathochromism and hypsochromism observed in the UV-vis spectrum compliment the heterointeractions suggested by FTIR studies.

Keywords: self association, redshifting hydrogen bond, heterointeraction, hyperchromism, bathochromism, FTIR spectra.

Corresponding author

Dr. G. Arivazhagan

Associate professor of physics

Thiagarajar College

Madurai- 625009

Tamil Nadu, India.

E-mail address: arivuganesh@gmail.com (G. Arivazhagan)

Tel.: +91 9486377102; fax: +91 0452-2312375.

Download English Version:

https://daneshyari.com/en/article/5408782

Download Persian Version:

https://daneshyari.com/article/5408782

<u>Daneshyari.com</u>