

INFLUENCE OF DEPOSITION TEMPERATURE AND IMPURITIES ON THE REFRACTIVE INDICES OF THIN FILMS OF METHANOL AND ETHANOL

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Hydrogen-bonding interactions continue to attract extensive interests in a wide variety of fields, especially those the formation of assembly structures. Methanol, too, has been a frequent research subject because of its ability to form extended hydrogen-bond networks[4] as well as its importance as a common solvent, in practical applications including fuel cells and catalysis, and as an abundant species to consider in various astrophysical and aerosol settings [1]. Many of these studies aim for a molecular picture of the structures and behavior of methanol in a heterogeneous environment, to resolve the underlying mechanisms that take place at interfaces and are often different from the bulk phenomena [2]. This work presents the results of an experimental study of the temperature dependence and impurities of argon and nitrogen on the refractive indices of thin films of methanol and ethanol and of the structural transformations of these substances. Measurements were carried out using a two-beam laser interferometer [3] in the temperature range of 14-130 K. It was found that near the temperatures of structural transformations, the temperature dependence of the refractive index shows a clear non-monotonic behavior.

[1] P.A. Gerakines and R.L. Hudson, *Astrophys. J.* **805**, L20 (2015).

[2] X. He *et al.*, *J. Chem. Phys.* **145**, 171102 (2016).

[3] A. Drobyshev *et al.*, *Low Temp. Phys.* **43**, 724 (2017).