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**NEW METHOD FOR MOLECULAR ORIENTATION OF LIQUID
CRYSTALS: PHOTOLITHOGRAPHY**

Suleyman YILMAZ ¹

¹ *Aksaray University, Faculty of Education, Department of Primary Education 68100, Aksaray, TURKEY*

Abstract: In this study, photolithography was applied on molecular alignment of Liquid Crystals (LCs) as a new method outside of conventional molecular orientation. Planar and homeotropic orientation were studied for the molecular orientation. In the photolithography, coating polyimide, UV exposing, chemical etching and curing process were applied to provide micro-grooving surface, respectively. Three type LC cells were made by provided rubbing and photolithography for planar alignment and also homeotropic alignment.

Electro-optical properties of the liquid crystal were examined under the electric field at phase transition region for three type LC Cells at the fixed temperature points, 300 K, 315K, and 325 K. Experimental setups was adjusted to measure optical transitions with thermal, electric and optic units. The photolithographic method was found more effective and acceptable than the other conventional methods for molecular orientation. It was also observed that the molecular anisotropy and surface anchoring of liquid crystal was affected considerably by the applied electric field.

Keywords: *Liquid Crystals; Polyimide Coating; Photolithography; Electro-Optical Properties.*

* Corresponding author; Suleyman YILMAZ, Tel.: +(90) 3822883358, E-mail: yilmazsuleyman@yahoo.com