이온빔처리된 고분자막을 이용한 TN 셀의 전기광학특성

김대현, 옥철호, 박홍규, 김병용, 황정연, 서대식
연세대학교

Electro-optical property of twisted nematic liquid crystal cells with ion-beam irradiated polymer surface

Dae-Hyun Kim, Chul-Ho Ok, Hong-Gyu Park, Byoung-Yong Kim, Jeong-Yeon Hwang, and Dae-Shik Seo
Yonsei University

Abstract : To date, rubbing has been widely used to align LC molecules uniformly.[1] Although rubbing can be simple, it has fundamental problems such as the generation of defects by dust and static electricity, and difficulty in achieving a uniform LC alignment on a large substrate. Therefore, noncontact alignment has been investigated. Ion beam induced alignment method, which provides controllability, nonstop process, and high resolution display.[2-3] We investigated the high pretilt angle effects on electro-optical properties of ion beam (IB)-irradiated liquid crystal cells on a blended polymer surface. High pretilt angle of liquid crystals IB-irradiated on a blended polymer surface including such as 5% and 10% of homeotropic polymer contents can be achieved. The threshold voltages of IB-irradiated twisted nematic (TN) cells on a blended polymer surface decrease with increasing the pretilt angle. Also, the rising time of IB-irradiated TN cells decreases with increasing the pretilt angle. However the decay time of IB-irradiated TN cells increases with increasing the pretilt angle. Consequently, the electro-optical properties of IB-irradiated TN cells depend strongly on the pretilt angle in a blended polymer surface.

Key Words : Liquid crystal alignment, Ion-beam irradiation, Blended polyimide, Pretilt angle, Electro-optical characteristics

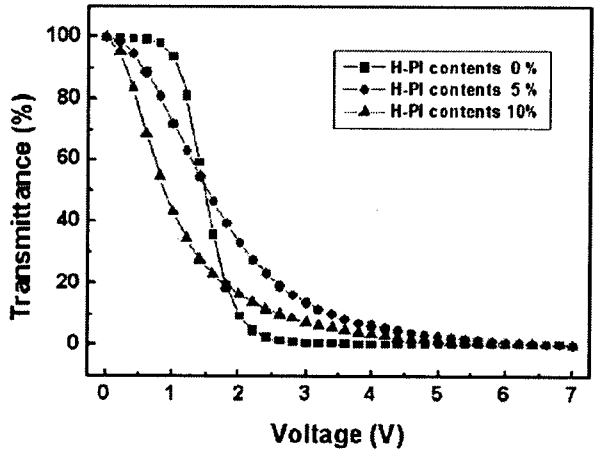

Figure 1. Voltage-transmittance curve of the TN-LCD with IB-irradiated polymer surface as a function of the concentration of homeotropic PI.

참고 문헌

[1] D.-S. Seo, S. Kobayashi and M. Nishikawa, Appl. Phys. Lett. Vol. 61, p. 2392, 1992.

[2] J.-Y. Kim, B.-Y. Oh, B.-Y. Kim, Y.-H. Kim, J.-W. Han, J.-M. Han and D.-S. Seo, Appl. Phys. Lett. Vol. 92, p. 043505 2008.

[3] H. G. Park, B. Y. Oh, Y. H. Kim, B. Y. Kim, J. M. Han, J. Y. Hwang, and D. S. Seo, Electrochem. Solid State Lett. Vol. 12, p. J37 2009.