

## 이온빔 조사각도에 따른 네마틱 액정의 액정 배향 특성

이강민, 오병윤, 박흥규, 임지훈, 이원규, 나현재, 김병용, 한정민, 이상극, 서대식  
연세대학교

### LC Orientation Characteristics of NLC on Polyimide Surface According to Ion-beam Irradiation Angles

Kang-Min Lee, Byeong-Yun Oh, Hong-Gyu Park, Won-Kyu Lee, Ji-Hun Lim, Hyun-Jae Na, Byoung-Yong Kim,  
Jeong-Min Han, Sang-Keuk Lee and Dae-Shik Seo  
Yonsei University.

**Abstract :** To date, rubbing has been widely used to align LC molecules uniformly.<sup>1</sup> 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.<sup>2-3</sup> In this study, we investigated liquid crystal (LC) alignment with ion beam (IB) that non contact alignment technique on polyimide and electro-optical characteristics of twisted nematic (TN)-liquid crystal display (LCD) on the polyimide under various ion beam angles. In this experiment, Polyimide layer was coated on glass by spin-coating and Voltage-transmittance(VT) and response time characteristics of the TN cell were measured by a LCD evaluation system. The good characteristics of the nematic liquid crystal (NLC) alignment with the ion beam exposure polyimide surface was observed. The tilt angle of NLC on the PI surface with ion beam exposure can be measured under  $1^\circ$  for all of irradiation angles. In addition, it can be achieved the good EO properties, and residual DC property of the ion beam aligned TN cell on polyimide surface.

**Key Word:** Liquid Crystal alignment, Pretilt angle, Ion beam, Polyimide.

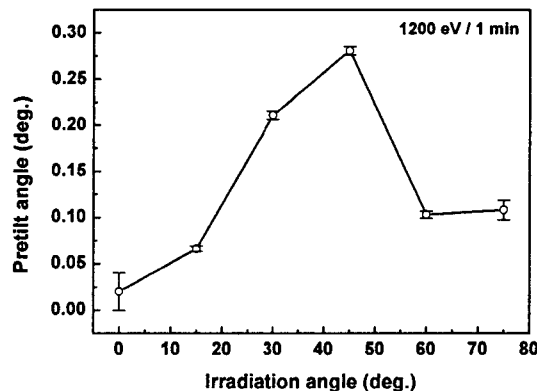


Figure 1. Pretilt angle of NLC on polyimide film

#### 참고 문헌

- [1] D.-S. Seo, S. Kobayashi and M. Nishikawa, Appl. Phys. Lett. 61 (1992) 2392.
- [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. 92, 043505 (2008)
- [3] C.-J. Park, J.-Y. Hwang, H.-K. Kang, H.-J. Ahn, J.-B. Kim, K.-C. Kim, H.-K. Baik, and D.-S. Seo, Jpn. J. Appl. Phys. 44 (2005) 1352.