

## 이온 빔 조사된 SiN<sub>x</sub> 박막의 전기 광학적 특성에 관한 연구

이상극, 오병윤, 김병용, 한진우, 김영환, 옥철호, 김종환, 한정민, 서대식  
연세대학교

### Investigation on EO Characteristics of SiN<sub>x</sub> Thin Film Irradiated by Ion-beam

Sang-Keuk Lee, Byeong-Yun Oh, Byoung-Yong Kim, Jin-Woo Han, Young-Hwan Kim, Chul-Ho Ok, Jong-Hwan Kim,  
Jeong-Min Han, and Dae-Shik Seo  
Yonsei Univ.

**Abstract** : For various applications of liquid crystal displays (LCDs), the uniform alignment of liquid crystal (LC) molecules on treated surfaces is significantly important. Generally, a rubbing method has been widely used to align the LC molecules on polyimide (PI) surfaces. Rubbed PI surfaces have suitable characteristics, such as uniform alignment. However, the rubbing method has some drawbacks, such as the generation of electrostatic charges and the creation of contaminating particles. Thus, we strongly recommend a non contact alignment technique for future generations of large high-resolution LCDs. Most recently, the LC aligning capabilities achieved by ultraviolet and ion-beam exposures, which are non contact methods, on diamond-like carbon (DLC) inorganic thin film layers have been successfully studied because DLC thin films have a high mechanical hardness, a high electrical resistivity, optical transparency, and chemical inertness. In addition, nitrogen-doped DLC (NDLC) thin films exhibit properties similar to those of the DLC thin films and a higher thermal stability than the DLC thin films because C:N bonding in the NDLC thin films is stronger against thermal stress than C:H bonding in the DLC thin films. Our research group has already studied the NDLC thin films by an ion-beam alignment method. The SiN<sub>x</sub> thin films deposited by plasma-enhanced chemical vapor deposition are widely used as an insulation layer for a thin film transistor, which has characteristics similar to those of DLC inorganic thin films. Therefore, in this paper, we report on LC alignment effects and pretilt angle generation on a SiN<sub>x</sub> thin film treated by ion-beam irradiation for various N ratios.

**Key Words** : LC alignment, ion beam, SiN<sub>x</sub>, pretilt angle, incidence angle