

이온빔 조사 각도와 에너지강도에 의한 수직 배향막의 특성 분석

강동훈, 오병윤, 김병용, 한진우, 김영환, 옥철호, 한정민, 이상극, 서대식
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Characteristic Analysis of Vertical Alignment by Ion-beam Irradiation Angle and Energy Density

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Abstract : The Liquid Crystal (LC) alignment uniformity is very important in LC devices. The alignment mechanism of LC molecules on a rubbed polyimide (PI) surface is very important for both LC fundamental research and application. So, Generally a rubbing method to align LC has been widely used to mass-produce LCD panels. But because rubbing method is contact method between rubbing fabric and indium-tin-oxide glass or flexible substrate, rubbing method has some defects, such as the electrode charges and the creation of contaminating particles. Thus we strongly recommend a non-contact alignment technique for getting rid of some defects of rubbing method. Most recently, the LC aligning capabilities achieved by ion-beam exposure on the organic and nonorganic thin film surface have been reported successfully.

In this research, we studied the tilt angle generation and electro-optical performances for a NLC on homeotropic polyimide surfaces with ion-beam exposure. The LC aligning capabilities of a nematic liquid crystal (NLC) on a homeotropic PI surface using a new ion-beam method were studied. On the homeotropic PI surface, the tilt angle of the NLC by exposure ion-beam had a tendency to decrease as increased ion-beam energy density. And, on the homeotropic PI surface, the alignment character of the NLC with respect to ion-beam energy was good. And we achieved satisfactory result for EO character.

Key Words : Homeotropic, Polyimide, LC alignment, pretilt angle, response time, voltage-transmittance, Ion-beam