

## 배향막 응용을 위한 이온 빔 조사된 ZnO박막에 관한 연구

강동훈, 김병용, 김종연, 김영환, 김종환, 한정민, 옥철호, 이상극, 서대식  
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### Study on ZnO Thin Film Irradiated by Ion Beam as an Alignment Layer

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**Abstract :** In this study, the nematic liquid crystal (NLC) alignment effects treated on the ZnO thin film layers using ion beam irradiation were successfully studied for the first time. The ZnO thin films were deposited on indium-tin-oxide (ITO) coated glass substrates by rf-sputter and The ZnO thin films were deposited at the three kinds of rf power. The used DuoPIGatron type ion beam system, which can be advantageous in a large area with high density plasma generation. The ion beam parameters were as follows : energy of 1800 eV, exposure time of 1 min and ion beam current of 4 mA/cm<sup>2</sup> at exposure angles of 15°, 30°, 45°, and 60°. The homogeneous and homeotropic LC aligning capabilities treated on the ZnO thin film surface with ion beam exposure of 45° for 1 min can be achieved. The low pretilt angle for a NLC treated on the ZnO thin film surface with ion beam irradiation for all incident angles was measured. The good LC alignment treated on the ZnO thin film with ion beam exposure at rf power of 150 W can be measure. For identifying surfaces topography of the ZnO thin films, atomic force microscopy (AFM) was introduced. After ion beam irradiation, test samples were fabricated in an anti-parallel configuration with a cell gap of 60 $\mu$ m.

**Key Words :** ZnO, ion beam, LC alignment, pretilt angle