

Pile Contact Depth Effects in Rubbed Polyimide(PI) Films

김기정¹, 권혁민³, 이상문³, 이철구³, 곽무선³, 김봉수^{1,2}

¹포항가속기연구소, ²포항공과대학교 물리학과, ³LG Display

To determine the molecular directionality of PI chains depending on rubbing condition, we measured the angle resolved near edge X-ray absorption fine structure (NEXAFS) spectra at C K-edge of the rubbed PI films. Twisted nematic mode PI (PI-TN) and in plane switching mode PI (PI-IPS) were introduced to examine the effect of rubbing conditions on the chain directionality. The average tilt angle α of the PI molecules was estimated through the measured intensity change of C=C π^* in NEXAFS C K-edge spectrum by controlling the stage speed and the pile contact depth. After rubbing, the irregular molecular direction changed to a regular direction with a molecular tilt angle of 51.2° for PI-TN and 49.6° for PI-IPS at the rubbing condition of the roll speed of 1000 rpm, stage speed of 50 mm/sec, and file contact depth of 0.3 mm. The molecular tilt angle α was linearly decreased in the PI-TN and PI-IPS samples with increasing depth of the pile contact.