

Photoalignment Behavior on Polystyrene Films Containing Chalcone Moieties

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A series of polystyrene derivatives containing chalcone side groups, poly(4-(4-vinylbenzyloxy)chalcone)(PCHAL#), where # is the molar composition of chalcone using polymer modification reactions, were prepared in order to investigate the effect of the chalcone side groups on the liquid crystal (LC) alignment properties. The LC alignment behavior of the polymer was studied using photoalignment method. The LC cells fabricated with photoirradiated PCHAL# films showed homogeneous planar LC alignment with an very low pretilt angle of approximately 0°. We found that LC aligning ability of the LC cells made from photoirradiated PCHAL# films was affected by the molar composition of chalcone side groups. For example, the azimuthal anchoring energy of a PCHAL100 (9×10^{-6} J/m²) was found to be much larger than that of PCHAL18 (5×10^{-7} J/m²). In addition the electro-optical performances of the LC cells made from PCHAL100 films such as threshold voltage, driving voltage, and response time were as good as those fabricated from rubbed polyimide films, the most widely used LC alignment layers.