P-42

Multi-domain liquid crystal alignment by micro-contact printed polymer layers

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We propose a patterning method of liquid crystal (LC) alignment layers for producing multi-domain LC structures. It is demonstrated that conventional LC alignment materials such as commercially available polyimides can be easily patterned on an ITO substrate or a polymer film by controlling pattern-transferring conditions such as baking procedures of solvented polymers and facilitating wetting properties of patterning materials on a mold surface and a base surface to be patterned. Several types of multi-domain LC geometries can be produced depending on the patterning materials, the base film, and the patterned shapes. Our micro-contact printing method is expected to be a very useful tool in enhancing or designing electro-optic properties of LC-based devices with multi-domain LC structures due to its simplicity in fabrication as well as the stability of the patterned LC anchoring.

The 10th JAPAN-KOREA INTERNATIONAL SYMPOSIUM On Advanced Display Materials and Devices

ADMD2006

22-23 June 2006

Kumamoto, Japan

Under the Auspices of

The Japanese Liquid Crystal Society

The Korea Society of Industrial Engineering Chemistry

The Society for Information Display, Korea Chapter

Advanced Display Manufacturing Research Center(ADMRC)

Mobile Display Research Center(MDRC)

Supported by

The Grant-in-Aid for Scientific Research(S) (16105004) from the Japan Society for the Promotion of Science

Banquet 19:00-21:00

KUSUNOKI KAIKAN in North Campus