高分子学报 2006 (7): 908-911 ISSN: 1000-3304 CN: 11-1857/O6

论文

软光刻技术制备液晶显示用定向层

和亚宁, 刘斌, 任鸿烽, 王晓工

清华大学化工系高分子研究所教育部先进材料重点实验室; 清华大学化工系高分子研究所教育部先进材料重点实验室 北京

收稿日期 2005-6-2 修回日期 2005-7-22 网络版发布日期 接受日期

摘要 以偶氮聚合物光致表面起伏光栅为模板, 制备聚二甲基硅氧烷(PDMS)弹性印章, 再以可溶性聚酰亚胺(PI)为“墨水”, 在石英玻璃上压印出具有规则起伏结构的PI薄膜. 由此制备的PI薄膜显示出很好的使液晶分子定向排列的效果. 此方法成本低、效率高, 是一种实用的液晶定向层薄膜制备方法.

关键词 聚二甲基硅氧烷 起伏光栅 微接触压印 定向层

分类号

LIQUID CRYSTALS ALIGNMENT LAYER PREPARED BY SOFT LITHOGRAPHY

HE Yaning,LIU Bin,REN Hongfeng,WANG Xiaogong

Department of Chemical Engineering; Laboratory for Advanced Materials Tsinghua University; Beijing 100084

Abstract Elastomeric replica surface relief structures were prepared by molding poly(dimethylsiloxane)(PDMS) elastomers on the photo-inscribed surface—relief-gratings of azo polymer film. Then polymide(PI)solution was microcontact printing with the elastomeric PDMS on quartz slides. Good surface-relief-grating structures were formed on the quartz slides. Then the quartz slides covered with surface-relief-grating PI films were assembled to liquid crystal(LC) cell. The transmittance passing through the cell between crossed polarizers changed periodically with a regnlas 90° separation of the rotational angle.The pretilt angle of the cell was found to be 2. 8°. The results showed that the PI film with surface—relief-grating structures by micrecontaet printing process has good liquid crystal alignment ability. This alignment method call be considered as potentially useful technology in the future LC display (LCD)industry.

Key words PDMS Surface relief gratings Microcontact printing Alignment layer

DOI:

通讯作者 王晓工