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材料物理和化学

聚酰亚胺液晶垂直取向膜的表面取向分析

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摘要: 采用均苯四甲酸二酐(PMDA)、4,4'-二胺基二苯甲烷(MDA)以及侧基含联苯和己基的二胺(TBCA)三元共聚制备了聚酰亚胺垂直取向剂, 摩擦前后得到相同的垂直取向效果, 探讨了侧链二胺TBCA的含量对聚酰亚胺取向膜垂直取向性能的影响, 采用衰减全反射红外光谱(ATR-FTIR)对摩擦前后聚酰亚胺膜表面侧链的相对含量进行了对比, 并运用原子力显微镜(AFM)考察了表面细微沟纹对液晶分子取向的影响。结果表明, 在取向膜未经摩擦没有产生表面沟纹的情况下液晶分子也能取向, 并且这类取向膜表面侧链的含量与摩擦后的含量相当。

关键词: 垂直取向 聚酰亚胺 取向膜 侧链 沟纹

Surface Alignment Analysis of Polyimide Liquid Crystal Vertical Alignment Films

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Abstract: Polyimide (PI) was synthesized by copolymerization of PMDA, MDA and TBCA in this paper. The films prepared by PI can induce the same vertical alignment before and after rubbing. The effect of content of TBCA on the alignment property was discussed, the relative content of surface side chains was observed by the ATR-FTIR spectra of the PI films surface, and the effect of the microgrooves on the liquid crystal was investigated by atomic force microscope (AFM). The PI films without microgrooves before rubbing can align liquid crystal molecules. Moreover, the content of surface side chains of this PI films before rubbing is the same as that after rubbing.

Keywords: vertical alignment polyimide alignment films side chains microgrooves

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