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材料物理和化学

聚合网络的锚定作用对聚合物稳定胆甾相液晶光电性能的影响

张俊^{1,2}, 宋志刚^{1,2}, 熊贤凤^{1,2}, 牛红林^{1,2}, 陆红波¹, 吕国强¹

1. 特种显示技术教育部重点实验室, 特种显示技术国家工程实验室, 现代显示技术省部共建国家重点实验室培育基地, 安徽 合肥 230009;
2. 合肥工业大学 仪器科学与光电工程学院, 安徽 合肥 230009

摘要: 采用紫外光聚合诱导相分离法(PIPS)制备了聚合物稳定胆甾相液晶,通过控制聚合时间,调节聚合物网络与液晶分子之间的相互作用,从而改善PSCT的光电性能。结果表明:延长聚合时间,提高反应程度,从而增强聚合物网络对液晶分子的锚定力,而对聚合物网络形貌的影响较小。在正模式聚合物稳定胆甾相液晶中,聚合物网络垂直于基板排列,有利于形成场致向列相,锚定作用强,阈值和饱和电压小,关态透过率高,对比度低,响应速度慢,迟滞宽度大。

关键词: 聚合物稳定胆甾相液晶 光电性能 快速响应光阀 聚合时间

Influence of Anchoring Effect of Polymer Network on Electro-Optic Property of Polymer-Stabilized Cholesteric Texture

ZHANG Jun^{1,2}, SONG Zhi-gang^{1,2}, XIONG Xian-feng^{1,2}, NIU Hong-lin^{1,2}, LU Hong-bo¹, LV Guo-qiang¹

1. Key Lab of Special Display Technology, Ministry of Education, National Engineering Lab of Special Display Technology, National Key Lab of Advanced Display Technology, Hefei University of Technology, Hefei 230009, China;
2. School of Instrument Science and Opto-Electronic Engineering, Hefei University of Technology, Hefei 230009, China

Abstract: Polymer-stabilized cholesteric texture (PSCT) samples were prepared by means of polymerization induced phase separation. The electric property of PSCT can be improved by adjusting curing time, which results in the control of the elastic force between polymer networks and liquid crystal molecules. It was indicated that extending the polymerization time can improve the degree of polymerization of monomer, thereby enhancing the anchoring force of polymer networks, whereas has little influence on the morphology of polymer networks. In a normal-mode PSCT, polymer networks are arranged perpendicular to the base plate, which is conducive to the formation of a nematic phase induced by an electric field. With enhancing anchoring effect, low threshold (saturated) voltage, high closed transmittance, low contrast ratio, slow response, and big hysteresis width can be observed.

Keywords: polymer-stabilized cholesteric texture electro-optic property fast-response light shutter curing time

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通讯作者: 陆红波, E-mail: bozhilu@hfut.edu.cn

作者简介: 张俊(1989-),男,江苏扬州人,硕士研究生,主要从事液晶显示与成像方面的研究。

作者Email: bozhilu@hfut.edu.cn

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