

液晶与显示 2012, (5) 608-612 ISSN: CN:

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材料物理和化学

混合排列向列相液晶盒电容特性研究

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摘要：基于液晶弹性理论和变形原理,研究了强锚泊混合排列向列相液晶盒的电容特性,同时考虑了液晶挠曲电特性的影响。通过Matlab软件数值模拟得到了不同挠曲电系数下电压-电容曲线,当挠曲电系数和 $e_{11}+e_{33} \geq 0$ 时,电容随电压线性增加;当 $e_{11}+e_{33} < 0$ 时,电容随电压的增加先减小后增大。并且,随挠曲电系数绝对值的增加,挠曲电效应对电容的影响亦将增大。

关键词：电容特性 混合排列向列相 挠曲电特性 强锚泊

Capacitance Characteristics of Hybrid Aligned Nematic Liquid Crystal Cell

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Abstract: Based on the elastic theory of liquid crystal and variation theory, the capacitance characteristics of the strong anchoring hybrid alignment nematic (HAN) liquid crystal cell is studied considering the flexoelectricity of liquid crystal. Through numerical simulation using the Matlab software, the induced capacitance-voltage curves for different flexoelectric coefficients are obtained. With the increase of the applied voltage, the capacitance increases linearly for $e_{11}+e_{33} \geq 0$; however, for $e_{11}+e_{33} < 0$, the capacitance begins to decrease and then increases with increasing the applied voltage. And, with the increase of absolute value of the flexoelectric coefficients, the influence of flexoelectric effect on the capacitance will be also enlarged.

Keywords: capacitance characteristics hybrid aligned nematic flexoelectricity strong anchoring

收稿日期 2012-05-25 修回日期 2012-07-05 网络版发布日期

基金项目:

河北省自然科学基金(No. A2010000004);河北省教育厅项目(No. Z2011133, No. Z2012061);国家自然科学基金(No. 11147103, No. 10974042, No. 11274088);河北省高校重点学科资助项目

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