

论文

聚合物分散液晶(PDLC)材料的光聚合反应

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摘要:

以Ar⁺激光器为光源, 采用虎红、*N*-苯基甘氨酸、二季戊四醇羟基五丙烯酸酯和乙烯基吡咯烷酮分别作为光引发剂、共引发剂、预聚物和稀释剂, 与液晶材料TEB30A结合, 通过光聚合反应, 制备了聚合物分散液晶(PDLC), 用紫外光谱和荧光光谱对其反应机理进行了分析. 实验结果表明, PDLC是通过光引发剂吸收光子能量后与共引发剂相互作用, 形成自由基中间体并引发聚合反应, 使预聚物与液晶产生相分离形成的.

关键词: 液晶; 光聚合反应; 聚合物分散液晶

Investigation on the Photo-polymerization of PDLC

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Abstract:

Polymer dispersed liquid crystal(PDLC) has extensive applications in non-linear optical material, displays and optical attenuation devices. In this paper, Ar⁺ laser was used as radiation source and Rose Bengal, *N*-phenyl glycine(NPG), dipentaerythrol hydroxy penta actylate, 1-viny-2-pyrrolidone were applied as photoinitiator, coinitorator, pre-polymer, thinner respectively to prepare PDLC with liquid crystal TEB30A. Ultraviolet spectra and spectrofluorimetry were applied to analyze the mechanism of the photo-polymerization reaction. The result indicates that by absorbing the photo energy, the initiator interacts with NPG to produce free radical, which induces the polymerization to produce the phase separation between the pre-polymer and the liquid crystal.

Keywords: Liquid crystal; Photo-polymerization; Polymer dispersed liquid crystal

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