

記錄 編號	3194
狀態	NC088FJU00065011
助教 查核	
索書 號	
學校 名稱	輔仁大學
系所 名稱	化學系
舊系 所名 稱	
學號	487336109
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論文 名稱 (中)	偶氮系梳狀側鏈液晶高分子的光變色性與介電行為研究
論文 名稱 (英)	Dielectric and Photochromic Behavior in Comb-Shaped Liquid Crystalline Polymers Containing Azobenzene Side Group
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校內 全文 開放 日期	不公開

校外全文開放日期	不公開
全文不開放理由	
電子全文送交國圖.	同意
國圖全文開放日期.	2005.01.01
檔案說明	電子全文
電子全文	01
學位類別	碩士
畢業學年度	88
出版年	
語文別	中文
關鍵字(中)	光致變 介電 梳狀型高分子 梳狀型液晶高分子
關鍵字(英)	Photochromic Behavior SCLCP Comb-Shaped Liquid Crystalline Polymer Dielectric Behavior Comb-Shaped Polymer
摘要(中)	摘要 將偶氮色團(Azobenzene dye)接於具液晶特性之側鏈液晶高分子上，由於具有良好的分子排列特性、互溶性、加工性及易驅動性等性質，適用作光資訊儲存材料，近年日益引起重視。本研究合成六種含偶氮基團之梳

	<p>狀型側鏈液晶高分子，偶氮基團之對位上接有具不同拉電子強度之取代基(-NO<sub>2</sub>、-CN、-COCH<sub>3</sub>)，而液晶軟鏈部份則分別為(-CH<sub>2</sub>-)<sub>3</sub>及(-CH<sub>2</sub>-)<sub>9</sub>。所合成之六種梳狀液晶高分子其結構均經過 NMR、IR、GPC、UV 之分析鑑定確定。熱重分析儀(TGA)測試，在 250°C 時仍具有良好的熱穩定性。DSC 圖譜顯示，大部份高分子在加熱過程中形成特殊的中間相(POM 顯示接近 Smectic 相)。此含偶氮色團梳狀液晶高分子在光照射下(λ=365 nm)，產生順一反式異構化反應(trans-cis photoisomerization)，並有光及熱可恢復之特性。其軟鏈(Spacer)越長、苯環上拉電子基越強，此恢復愈快，在介電鬆弛研究中，亦發現 Spacer 長度與拉電子基的強弱也會影響到 β-鬆弛發生的位置。其中含-NO<sub>2</sub>基之 β-鬆弛發生溫度最低。另外各種高分子之 T<sub>m</sub> 點及 T<sub>g</sub> 點亦可經發生由 δ-鬆弛及 α-鬆弛的位置上，更精確獲的測得。</p>
<p>摘要 (英)</p>	<p>Abstract Photochromic dye molecules (Such as azobenzenes) change their molecular shape upon photo irradiation, and this property has been used extensively to control the orientation of liquid crystals by light. Besides, azobenzene liquid crystals have been developed, in which the azobenzene moiety plays roles as both mesogens and photosensitive chromophores. The trans form of azobenzene derivative is rod-like, which stabilizes the LC phase, whereas the cis form is bent and destabilizes the LC phase when it is present. Therefore, the trans-cis photoisomerization of azobenzene in the LC phase can cause disorganization of the phase structure. In addition, the cis-trans back-isomerization can take place either by a thermal process or a photochemical process. All these properties enable the comb-shaped side-chain LC polymer (SCLCP) containing an azobenzene moiety a promising material for optical switch and image storage. This study synthesized six SCLCPs of this type in which the azobenzene moiety was attached with different electron-withdrawing group (i.e.,-NO<sub>2</sub>,-CN,-COCH<sub>3</sub>) on the para position, and the soft spacer used was either (-CH<sub>2</sub>-)<sub>3</sub> or (-CH<sub>2</sub>-)<sub>9</sub> segment. All their structure were characterized by GPC, NMR, IR, UV, DSC, TGA and POM. All there SCLCPs were stable up to 250°C, and exhibited some stable mesophases (mostly Smectic phase), as confirmed by POM and DSC observations. Photoirradiation was performed with a 100W high-pressure Hg lamp. The change in transmittance of 365 nm absorbance band (corresponding to π-π* transition of trans-azobenzene) was monitored as a function of irradiation time. These results showed that the spacer length and electron-withdrawing capability were the two factors which enhancing the backward isomerization processes, but not for the forward trans-cis isomerization process, Dielectric relaxation studies exhibited a more clear-cut picture for the mesophase transitions of these SCLCP than that of DSC and POM showed. The two factors mentioned above also affects the location of occurrence of β-relaxation.</p>
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論文 頁數	124
附註	
全文 點閱 次數	
資料 建置 時間	
轉檔 日期	
全文 檔存 取記 錄	
異動 記錄	M admin Y2008.M7.D3 23:17 61.59.161.35