

PHOTOREACTIVE HIGH PERFORMANCE POLYMERS AND THEIR ABILITIES TO CONTROL LIQUID-CRYSTAL ALIGNMENT: EFFECTS OF UV-IRRADIATION AND RUBBING

Moonhor Ree*, Sang Il Kim, Seung Woo Lee, and Young Hee Park

Department of Chemistry and Polymer Research Institute

Pohang University of Science and Technology

San 31, Hyoja-dong, Pohang 790-784 Korea

Two photoreactive polymers were synthesized as follows. A high performance polymer with two hydroxyl side groups was first prepared by a synthetic procedure reported previously in the literature [1]: poly(3,3'-dihydroxy-4,4'-biphenylene 3,3',4,4'-diphenyl-2,2'-hexafluoropropanetetracarboximide) (6FDA-HAB) with $\langle M_w \rangle = 53,400$. The 6FDA-HAB polymer was reacted further with cinnamic acid and 4-fluorocinnamic acid, giving photoreactive polymers: 6FDA-HAB-CI and 6FDA-HAB-CF. These polymers were dissolved in cyclohexanone and then spin-cast on quartz slides plates, followed by drying at 100°C in a vacuum oven. The thickness of thin films was ca. 100 nm. The films were treated with unpolarized uv light of 260-380 nm by varying exposure dose, and characterized by uv-visible spectrometry. The measured uv-visible spectra are shown in Fig. 1.

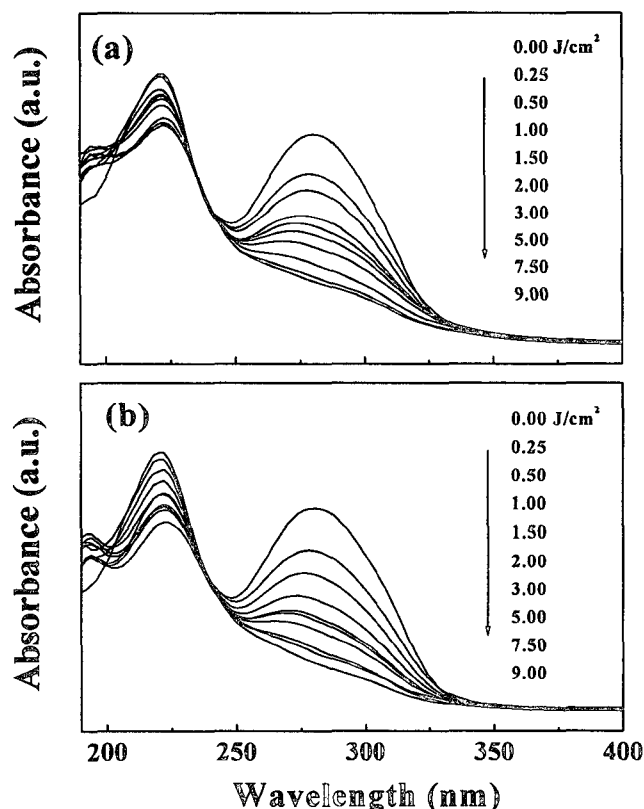


Fig. 1. UV-visible absorption spectra of polymer films irradiated with unpolarized uv light; (a), 6FDA-HAB-CI; (b), 6FDA-HAB-CF.