

SSNN 38P OPTICAL AND PHOTO-INDUCED PROPERTIES OF CARBAZOL-CONTAINING POLYMERS WITH AZONITRODYE

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Recently polymer materials with azodyes become attractive materials for holographic recording due to possibility of surface relief grating fabrication with high diffraction efficiency and resolution. Large surface modulation (greater than 300 nm) and high diffraction efficiency (greater than 30%) could be obtained under optimal recording conditions [1]. One of the main advantages of these materials is the relief pattern obtaining without any additional treatment with organic solvents [2].

In this work the optical properties and photo-induced effects study of the copolymer of poly(9-epoxypropyl)carbazole (PEPC) with azodye Disperse Orange, was carried out. Copolymer of epoxypropylcarbazole with Disperse Orange was obtained by polycondensation scheme shown in Figure 1.

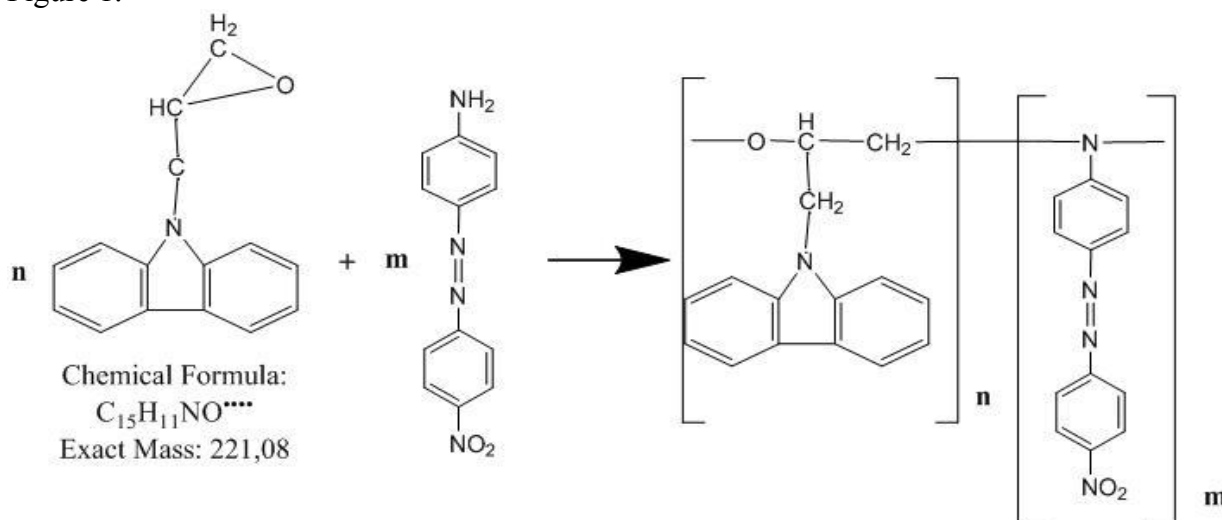


Figure 1. Scheme of copolymerization of epoxypropylcarbazole with Disperse Orange

Polymerization was carried out in closed ampoule at a temperature of 120° C for 4 hours. The copolymer was purified by precipitation in hexane and then in methanol. Reaction product yield of the polymerization reaction was 60%. The resulting material was investigated by FTIR spectroscopy using attenuated total reflectance (ATR) accessory of Spectrum 100 FTIR (PerkinElmer) spectrometer in 4000 - 650 cm⁻¹. Analysis of IR spectra showed the appearance of new absorption bands at 814 cm⁻¹ and 1516 cm⁻¹, characteristic for nitro-groups and at 3069 cm⁻¹ characteristic for secondary amino-group. Optical spectra in UV-VIS region were measured by SPECORD M40 (200-900 nm). The spectrum showed absorption band around peak absorption at λ_{max} = 660 nm. To observe the photo-induced effects 473 nm DPSS laser was used.

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