



- > MainPage
- > About College
- > Files
- > Researches
- > Courses
- > Favorite Links
- > Our Contacts

Visits Of this Page: 10



Research Details :

Research Title	: <u><i>Photochromic properties of (E)-dicyclopropyl-methylene-(2,5-dimethyl-3-furylethylidene)-succinic anhydride doped in PMMA polymer film</i></u> <u><i>Photochromic properties of (E)-dicyclopropyl-methylene-(2,5-dimethyl-3-furylethylidene)-succinic anhydride doped in PMMA polymer film</i></u>
Description	: A film of fulgide 1-E doped in a PMMA polymer film and spread over a quartz plate was irradiated with ultraviolet light (366 nm), the film was turned pink. The later color was switched back to the original color when the film was irradiated with a white light. The photocoloration and photobleaching reactions obeyed first order rate equations with rate constants equal $1.49 \times 10^{23} s^{-1}$ and $5.75 \times 10^{22} s^{-1}$, respectively. Another two films were heated for four hours, one at 62 °C and the other at 82 °C. The fatigue resistant of the film was greatly improved when the annealing temperature increased to 82 °C. The UV-spectra of the films show two absorption maxima at $\lambda_{max} = 360$ and 300 nm. The UV-spectra of the annealed film at 82 °C show a decrease in the height of the second maximum absorbance band at $\lambda_{max} = 300$ nm. Similarly, the photocoloration and photobleaching reactions of the annealed films show first order rate equations. Interestingly, the rate of the photocoloration reaction increases with increasing the annealing temperature. On the other hand, the rate of the photobleaching reaction is almost similar for the three films. In conclusion, the Photochromic properties of fulgide 1-E doped in PMMA polymer film was improved significantly upon annealing at 82 °C, compared with other epoxy films we studied previously.
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