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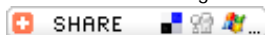
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Research Title : *Photochromic properties of (E)-dicyclopropylmethylene-(2,5-dimethyl-3-furyiethylidene)-succinic anhydride doped in epoxy polymer film*
Photochromic properties of (E)-dicyclopropylmethylene-(2,5-dimethyl-3-furyiethylidene)-succinic anhydride doped in epoxy polymer film

Descriptipn : Purpose - To evaluate the photochromic performance of photochromic compounds in polymer matrices.
Design/methodology/approach - The epoxy resin doped with photochromic fulgide were prepared and the effect of UV irradiation were studied using spectrophotometer. The reversible reaction was effected using white light. The effect of heat was also determined, Findings - A film of fulgide 1 -E doped in epoxy polymer was irradiated with UV light (366 nm), the film turned pink. The later colour was switched back to the original colour when the film was irradiated with a white light. The photocoloration and photobleaching obeyed first order rate equations with rate constants being $4.19 \times 10^{-3} \text{ s}^{-1}$ and $2.86 \times 10^{-2} \text{ s}^{-1}$, respectively. It was found that the film showed a good fatigue resistance. Another film was preheated at 80 degrees C for 1-4 h. No change in the UV absorption spectra of the film was observed. Similarly, the photocoloration and photobleaching of the annealed film showed first order rate equations with rate constants being $8.77 \times 10^{-3} \text{ s}^{-1}$ and $4.02 \times 10^{-2} \text{ s}^{-1}$, respectively. Interestingly, the photocoloration and photobleaching reactions of the annealed film were faster than those of the non-annealed film. Research limitations/implications - The epoxy resin doped photochromic fulgides described in the present paper was prepared and studied. The principle of study established can be applied to any type of resin or to any type of photochromic compounds. Practical implications - The photochromic materials developed can be used for different applications, such as coatings and holography. Originality/value - The method developed may be used to enhance the performance of photochromic materials.

Research Type : Article

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