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- Document Title** : THE PHOTOCROMIC PERFORMANCE OF SOME FULGIDES AND BIS-IMIDAZOLE DERIVATIVES IN THE PRESENCE OF ADDITIVES
الأداء الفوتوكرومي لبعض مركبات الفلجاييد وثنائي اميدازول في وجود مواد مضافة
- Document Language** : Arabic
- Abstract** : Photochromic fulgide are derivatives of 2,3-dialkylidene succinic anhydrides [2.13Z] containing hexatriene frame. The developed pink color upon irradiation of fulgides is due to the formation of 7,7a-dihydro-7,7-dicyclopropyl-2,4,7a-trimethylbenzo[b]furan-5,6dicarboxylic anhydride [2.14c]. The photocoloration process was found to obey a first-order rate equation . In this study investigation of the effect of some additives on the photochromic properties of fulgide was undertaken . Separate solution of additives (2.3a-f),(2.6a-e), (2.9a-d),(2.12a-e) and fulgide with equal initial concentration were prepared. Various volumes of the above solution were mixed well keeping the final volume constant. These solutions were then irradiated with UV light and their spectra were recorded with time. Increasing the mole fraction of the additives (2.3a-f),(2.6a-e), (2.9a-d) and (2.12a-e), shows different and various changes in half-life, these observed changes was found to depend on nature of the used additives. Also increasing the mole fraction of the fulgide shows various changes in half-life, these observed changes was found to depend on nature of the used additives. Keeping the mole fraction constant while increasing the initial concentration of additive and fulgide produces dramatic change in the half-life of photocyclization with all additives. In each mole fraction combination, it was observed that the half-life increases according to the used additive in the orders: [2.3a] > [2.3b] > [2.3f] > [2.3d] > [2.3c] > [2.3e] [2.6c] > [2.6e] > [2.3d] > [2.3b] > [2.3a] [2.9a] > [2.9d] > [2.9c] > [2.9b] [2.12b] > [2.12a] > [2.12c] > [2.12d] > [2.12e] . These changes could be tentavely related with the donar ability of the additives. As the donar ability increases, the half-life increases (in other words, the rate of photocyclization decreases). Donar ability increases in the order: [2.3e] > [2.3c] > [2.3d] > [2.3f] > [2.3b] > [2.3a] [2.6a] > [2.6b] > [2.6d] > [2.6e] > [2.6c] . [2.9b] > [2.9c] > [2.9d] > [2.9a] [2.12e] > [2.12d] > [2.12c] > [2.12a] > [2.12b]. The same study ware also done on another photochromic compound namely carbazole-bis imidazole[2.17], the study showed that fulgides take much time to color than evident by $t_{1/2}$. Also changing the additive showed appreciable effects .
- Supervisor** : أ.د/عبدالله بن محمد أحمد عسيري
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