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PHOTOCHROMIC FULGIDES OF THE INDOLE SERIES

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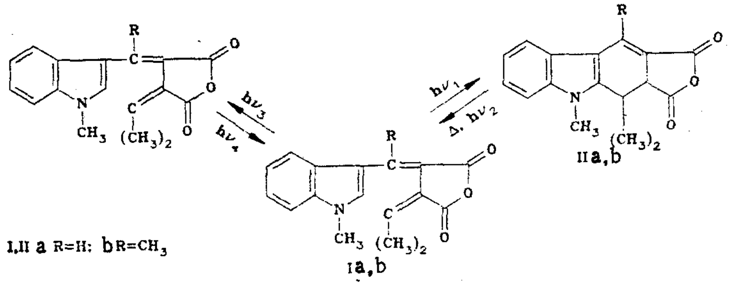
Heterocyclic fulgides have photochromic properties [1, 2]. We have synthesized 1-methyl-3-indolylmethylene-2-isopropylidene-3-[(1-methyl-3-indolyl)alkylidene]succinic anhydrides (fulgides Ia,b) by condensation of 1-methyl-3-formylindole and 1-methyl-3-acetylindole with diethyl isopropylidenesuccinate in the presence of sodium hydroxide with subsequent hydrolysis of the indolyl-substituted isopropylindenesuccinic acid esters and treatment of the resulting dicarboxylic acids with acetyl chloride.



Fulgide Ia. This compound was obtained in 65% yield and had mp 253-255°C (from o-dichlorobenzene). IR spectrum (mineral oil): 1790, 1745 cm^{-1}. PMR spectrum ($CDCl_3$ in the presence of two drops of CF_3COOH), δ: 1.95 (s, CH_3), 2.10 (s, CH_3), 3.50 (s, NCH_3), 6.80-7.42 (m, 5H), 8.52 ppm (s, CH).

Fulgide Ib. This compound was obtained in 58% yield and had mp 140-142°C (from CCl_4). IR spectrum (mineral oil): 1785, 1745 cm^{-1}. PMR spectrum ($CDCl_3$), δ: 0.88 (s, CH_3), 2.10 (s, CH_3), 2.74 (s, CH_3), 3.80 (s, NCH_3), 7.04-7.64 ppm (m, 5H).

The results of elemental analysis of the compounds obtained were in agreement with the calculated values. Information regarding the structures of the fulgides will be reported later.

Photoinduced changes in the absorption spectra that are associated with photoisomerization relative to the $C{=}C$ bond and the formation of cyclic form II are observed in the regions of their long-wave absorption bands (λ_{Ia} 380 nm and λ_{Ib} 412 nm) when solutions of fulgides Ia,b are irradiated at 293°K. Cyclic form IIa (λ_{max} 535 nm) is thermally unstable ($\tau \simeq$ 200 msec). At the same time, the analogous IIb form (λ_{max} 545 nm) is thermally stable at normal temperatures and is converted to the original structure only upon photoexcitation.

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