PHOTOCHROMIC 2-PYRRYLFULGIDES

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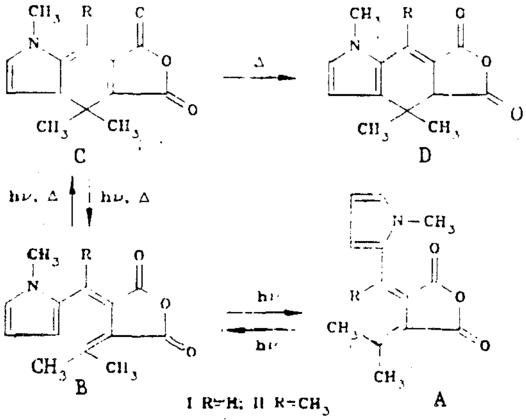
Previously obtained 3-pyrrylfulgides display photochromic properties [1]. We have synthesized isopropylidene[(1-methyl-2-pyrryl)methylene]succinic anhydride (fulgide I, R = H) and isopropylidene [1-(1-methyl-2-pyrryl)-2-ethylene]succinic anhydride (fulgide II, R = CH_3) by condensation of 1-methyl-2-acylpyrroles with diethyl isopropylidenesuccinate in the presence of sodium hydride with subsequent hydrolysis of the esters of pyrryl-substituted isopropylidenesuccinic acids and treatment of the resulting diacids with acetyl chloride.



I R = H; II R = CH_3

Fulgide I. This compound was obtained in 49% yield and had mp 173-175°C ($CH–Cl_3$-Silokhrom S-120, 0.1-0.2 fraction). IR spectrum (mineral oil): 1790, 1745 cm^{-1}. PMR spectrum ($CDCl_3$): 2.25 (s, CH_3), 2.42 (s, CH_3), 3.82 (s, NCH_3), 6.17-7.07 (3H), 7.9 ppm (s, CH).

Fulgide II. This compound was obtained in 6% yield and had mp 116-117°C ($CH–Cl_3$-Silokhrom S-120, 0.1-0.2 fraction). IR spectrum (mineral oil): 1785, 1735 cm^{-1}.

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

Changes in the absorption spectra that are associated with Z → E photoisomerization (A → B) and the formation of cyclic form C are observed when solutions of fulgides I and II are irradiated in the region of the long-wave absorption bands (λ_{max}^{IA} 400 nm and λ_{max}^{IIA} 396 nm, toluene). The isomerization of fulgides I and II is realized in the excited state. Cyclic form C is thermally stable only in solutions of fulgide II in slightly polar solvents (for example, in toluene λ_{max}^{IIC} 535 nm). A 1,5 shift of the hydrogen atom with the formation of colorless isomer D occurs in the ground state of cyclic form C.

LITERATURE CITED

1. H. G. Heller, S. N. Oliver, and S. A. Harris, European Offen. Patent No. 0190016; *Ref. Zh. Khim.*, 13N303P (1987).

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