PHOTOCHROMIC NAPHTHO[2,1-b]FURYL FULGIDES

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Photochromic heterocyclic fulgides are characterized by thermal stability of a colored form and high resistance to repeated photocoloration-photobleaching cycles. These properties make fulgides promising candidates for use in high-capacity 3D multilayer optical memory devices and as molecular switches.^{1,2} We have synthesized a series of novel 2- and 5-naphtho[2,1-*b*]furyl fulgides with different combinations of substituents (H, Me) in furan cycle and methylidene bridge and studied their spectral-luminescent and photochromic characteristics. The most interesting properties are shown by the example of fulgide 3Z.



This compound under UV irradiation rearranges into the colored fluorescent ring-closed isomer C. The reverse dark reaction $C \rightarrow E$ was not observed over 48 h. The exposure of 3-C to visible light results in the backward isomerization into the initial ring-opened non-fluorescent form O. Compound 3 is sufficiently fatigue resistant with respect to photodegradation and survives 10 cycles of photocoloration-photobleaching without notable decrease in the optical density at the absorption maximum of the cyclic form C.

References

1. Yokoyama, Y. Chem. Rev. 2000, 100, 1717.

2. Zmeeva, S.Yu.; Rybalkin, V.P.; Popova, L.L.; Tkachev, V.V.; Revinskii, Y.V.; Tikhomirova, K.S.; Starikov, A.G.; Dubonosov, A.D.; Bren,

V.A.; Aldoshin, S.M.; Minkin, V.I. Tetrahedron 2016, 72, 5776.

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