Photochromic behavior of spiropyrans: The effect of substituent

Nadir, N.a  , Wahid, Z.b  , Zainuddin, M.T.c  , Mohamed Islam, N.Z.d  

aDepartment of Mechatronics Engineering, International Islamic University Malaysia, P. O. Box 10, 50728 Kuala Lumpur, Malaysia
bDepartment of Science in Engineering, International Islamic University Malaysia, P. O. Box 10, 50728 Kuala Lumpur, Malaysia
cBiomedical Materials Section, Advanced Materials Research Centre (AMREC), SIRIM Berhad, Lot 34, Jalan Hi-Tech 2/3, Kulim Hi-Tech Park, 09000 Kulim, Kedah, Malaysia

Abstract

Spiropyrans are among the most promising organic photochromic dyes. However, spiropyrans are very sensitive dyes and there are many independent factors that can affect the performance of these dyes. The effect of substituent on the optical absorption spectra, fading kinetic, and also the dye stability of spiropyrans in diphenyl ether by UV irradiation has been investigated. The 6-nitro BIPS displayed greater absorbance intensity of 0.740% at 600nm compared to 8-ethoxy-6-nitro BIPS of 0.651% at 620nm. Furthermore, 6-nitro BIPS is less stable as it has higher rate constant of 0.1003s⁻¹ and thus lower half-life time (50% decay of the photochromic effect) of 6.9s, in contrast to 8-ethoxy-6-nitro BIPS of 0.0594s⁻¹ and 11.7s respectively. © (2014) Trans Tech Publications, Switzerland.

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Indexed keywords

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