

Luminescence Properties of Some Coumarins with 3:4-Fused Ring System

Peter Nikolov, Ivan Petkov^a, and Peter Markov^a

Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences,
1113 Sofia, Bulgaria

^a Department of Chemistry, Sofia University, 1126 Sofia, Bulgaria

Reprint requests to Dr. P. N.; E-mail: petnik@orgchm.bas.bg

Z. Naturforsch. **55a**, 741–744 (2000); received April 10, 2000

The photophysical characteristics of a group of coumarins with a 3:4-fused ring system (2-substituted-4,5-dioxo-1,2-dihydro-4H,5H-pyrano-[3:4-c][1]-benzopyrans) in solutions at room temperature, in frozen ethanol matrix at 77 K, in solid phase and in PVC films are reported. The low fluorescence quantum yield of the compounds investigated in solution is explained as a result of internal conversion from the fluorescent $S_2(\pi\pi^*)$ state to the lower lying $S_1(n\pi^*)$ state. The phosphorescence with a life time in the order of seconds is connected with intersystem crossing $S_1(n\pi^*) - T_1(\pi\pi^*)$. The absorption Franck Condon transitions in solid phase and in PVC matrix are only weakly bathochromically shifted according to solution.

Key words: Electronic Spectra, Fluorescence; Coumarins with 3:4-Fused Ring System.