

## The perpendicular triplet state of ethylenic compounds observed by nanosecond laser flash photolysis

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Transient absorption assigned to the triplet state in which the double bond is twisted by 90° (perpendicular triplet) was observed by laser flash photolysis of various ethylenic compounds such as  $\alpha,\beta$ -enones (methyl vinyl ketone, cycloheptenone, acetyl cyclohexene etc.) and styrenic derivatives (1-phenylcycloheptene, 1-phenylcyclohexene, substituted styrenes including stilbene and styrene itself). The lifetimes of the perpendicular triplet of these compounds range from 5 to 70 ns depending on the flexibility of the molecular structure and on the nature of the substituents attached to the double bond. The rate constant for quenching of the perpendicular triplets by oxygen is about  $(8 - 9) \times 10^9 \text{ M}^{-1} \text{ s}^{-1}$  (in toluene), *i.e.* about one-third of the diffusion rate constant and three times greater than the rate constant for quenching the usual aromatic triplet states: this is in agreement with the theory relating the quenching rate constant to spin statistic factors [1]. In most experiments the triplet states of styrenic compounds were populated by sensitization but population of the triplet states by direct excitation is also possible with quantum yields from 0.1 to 0.3 for *trans*- $\beta$ -methylstyrene and styrene and with somewhat lower yields (0.05 - 0.1) for compounds such as 1-phenylcyclohexene or  $\alpha$ -methylstyrene. Therefore the widely accepted idea that the yield of intersystem crossing is extremely low for flexible styrenic compounds must be revised.

1 J. Saltiel, *Chem. Phys. Lett.*, 37 (1976) 147.

## Fluorescence of organic molecules in tenside solutions around the critical micelle concentration

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Relative quantum yields of the blue fluorescence of acridine were measured in protic and aprotic homogeneous solvents of different polarities and in alkaline aqueous solutions of anionic, cationic and non-ionic surfactants around the critical micelle concentration (CMC) as functions of tenside concentration. Measurable quantum yields were detected only in protic homogeneous solutions and in