

state, as is already well known for their triplet state. The formation of the anthraquinone radical anion is discussed on the basis of the results obtained by flash photolysis.

Charge transfer quenching of $^3n,\pi^*$ and $^3\pi,\pi^*$ states by O_2 in the vapor phase

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Flash-excited triplet state benzene was used to sensitize phosphorescence of 13 aldehydes and ketones by collision. The rate constant k_q for quenching of this phosphorescence by O_2 ranges between 0.056×10^9 and 6.9×10^9 $M^{-1} s^{-1}$.

The biacetyl sensitization method of Parmenter and Ring was used to determine the quenching of the triplet state of benzene and 12 benzene derivatives. k_q ranges between 1.2×10^9 and 1.2×10^{10} $M^{-1} s^{-1}$.

For all molecules a relationship exists between k_q and ionization potentials that supports a mechanism involving the formation of a triplet donor- O_2 complex coupled to a charge transfer state. The absence of a deuterium effect indicates the limited importance of Franck-Condon factors, which dominate in the quenching of $^3\pi,\pi^*$ state polycyclic aromatic hydrocarbons in solution.

The differences in quenching behavior of polycyclic aromatic hydrocarbons and benzene derivatives are discussed.

On the intramolecular decay and energy transfer in liquid alkanes

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Alkanes are known to have very low fluorescence quantum yields (10^{-3}) and lifetimes (10^{-9} s). To obtain information about the mechanism of deactivation paths after excitation in the singlet manifold, lifetime measurements were performed as a function of temperature. The excitation of alkanes was achieved by a two-photon absorption of a pulsed nitrogen laser beam. A further aspect investigated was the mechanism of energy transfer from a liquid alkane to a

solute (benzene). The compounds which were studied were C_6H_{12} , C_6D_{12} and $C_{10}H_{18}$, with which both intensity and lifetime quenching experiments on the UV emission were performed. At variance with previous results, the quenching rate parameters obtained are consistent with a diffusional mechanism.

Effect of excited state switching on the photophysical characteristics of benzophenone and related molecules

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The study of the phosphorescence emission of a series of aryl ketones in acetic acid solution at liquid nitrogen temperature has shown that it is possible in this solvent to vary the nature of the lowest triplet state progressively from a predominantly n,π^* configuration to a predominantly π,π^* or charge transfer (CT) configuration by changing the substituent from electron withdrawing to electron releasing in nature. This behaviour has been evidenced by the presence of two components in the low temperature spectra, which invert their positions according to the nature of the substituent. This state switching is responsible for the different photophysical characteristics of aryl ketones in fluid solution. In fact, only n,π^* triplets display phosphorescence emission and efficient sensitizing power, whilst ketones with CT triplets neither phosphoresce nor sensitize but act as quenchers of n,π^* triplet ketones.

Two-photon photoionization of substituted anthracenes from the S_1 state: application to the study of intermolecular and intramolecular charge transfer

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Intermolecular and intramolecular deactivation of the excited states of the following compounds were studied by laser photolysis. Fluorescence quenching of the compounds 2-A(n) ($n = 2, 11$) occurs through the formation of non-fluorescent (or weakly fluorescent) intramolecular exciplexes. In solution a photoion-