

a lifetime of 420 ns (at 20 °C in methylcyclohexane) and a stabilization energy of 9 kJ mol⁻¹ resulted.

With the asymmetrically substituted diphenanthrylpropanes 29P3P and 39P3P, a triplet excimer could not be detected. This dependence of triplet excimer formation on the relative configuration of the phenanthrene moieties supports the assumption that with 99P3P the main contribution to the stabilization of the excimer comes from dispersion forces. This is in accord with recent theoretical considerations.

Also, singlet excimers are formed with 99P3P and decay predominantly by internal conversion. Their kinetics were studied using time-correlated single-photon counting.

Nature of the low temperature emission from 9-nitroanthracene

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From previous studies in this laboratory we have reported the phosphorescence behavior of nitronaphthalenes and the lack of phosphorescence from nitrobenzene. For 9-nitroanthracene (9-NA) where the lowest triplet is a π, π^* triplet, published reports indicate a phosphorescence with a 0-0 band in the vicinity of 20 000 cm⁻¹, which is somewhat inconsistent with the $S_0 \rightarrow T_1$ transition of 9-NA at 14 630 cm⁻¹, deduced by oxygen perturbation techniques. We undertook an investigation of the luminescence behavior of this molecule with the additional feature that the formation of an electron donor-acceptor complex was employed to assist in identifying the emission observed at 77 K. The advantage in forming a complex is that 9-NA becomes stabilized. Our results indicate that, in fact, the emission at 77 K from 9-NA is not molecular phosphorescence but emanates from the photoproduct of an efficient photochemical event. The quantum yield for the disappearance of 9-NA in ethyl alcohol at 77 K appears to approach unity. Elucidation of this photochemical event and the effect of solvent and temperature on the UV excitation behavior of 9-NA are discussed.