**Supplementary Material**

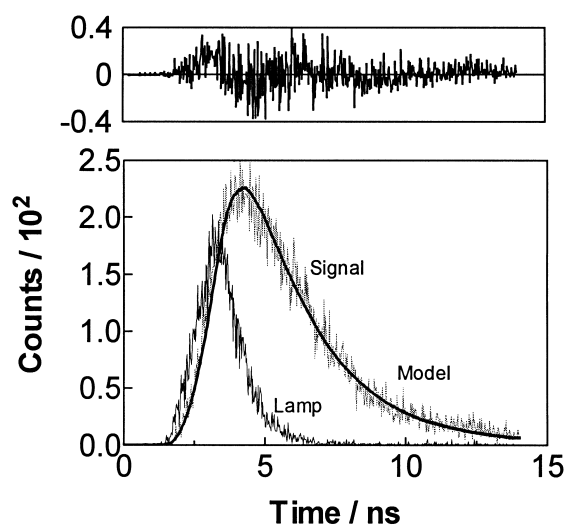

Fig. 1. Fluorescence decay kinetics in air-saturated toluene. $\lambda_{exc} = 300$ nm; $\lambda_{obs} = 680$ nm
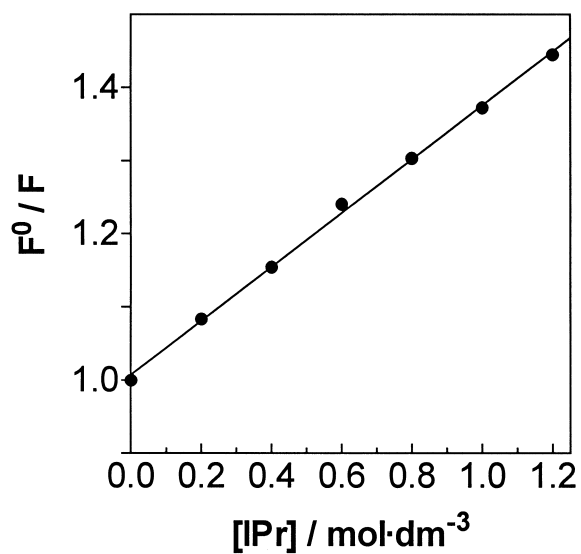
Fig.2. Stern-Volmer plot for the SubNc fluorescence quenching by 1-iodopropane in toluene, where $F$ is the area under the fluorescence spectrum. From the slope $K_{SV} = 0.373$ and the singlet lifetime $\tau_S = 2.5$ ns, a quenching rate constant of $k_q^{Ipr} = 1.47 \cdot 10^8$ $M^{-1}s^{-1}$ is calculated. The singlet-triplet energy gap is then calculated as $\Delta E_{ST_n} = 250.5 - 25.51 \cdot \log k_q^{Ipr}$ according to Dreeskamp et al.[12]
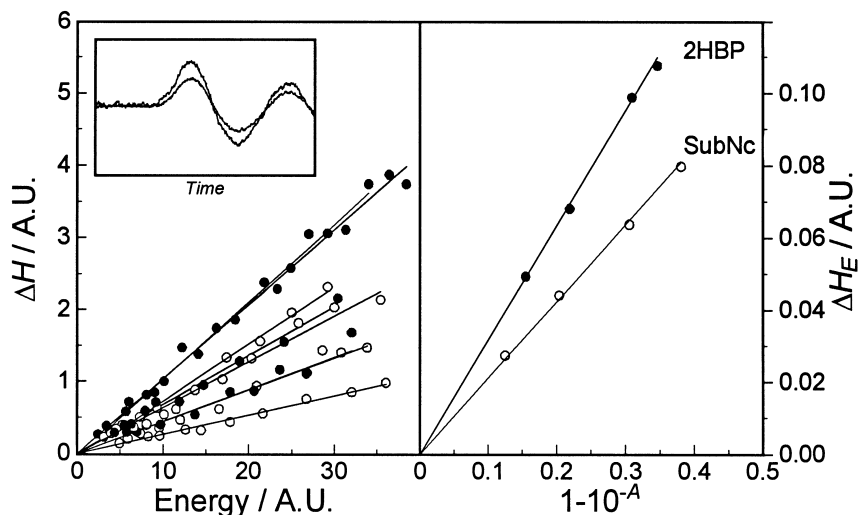
Fig.3. Determination of the product of the triplet quantum yield times the triplet energy

($\Phi_T E_T$) by laser-induced optoacoustic calorimetry. **Left**: Laser-energy dependence of the

optoacoustic signal (difference of amplitudes between the first maximum and the first

minimum) observed upon 355 nm laser flash photolysis of argon-saturated solutions of

SubNc and the calorimetric reference 2-hydroxybenzophenone. Each data set

corresponds to a solution of different absorbance. **Inset**: Typical optoacoustic signals for

SubNc and 2HBP in toluene. **Right:** The energy-normalized amplitudes are plotted vs.

the absorption factor $(1\text{-}10^{-A})$. The ratio of the slopes of the new lines, $\alpha$, is the fraction

of absorbed energy released as heat by SubNc in the submicrosecond time scale, which is

related to the its photophysical properties as $a = \dfrac{E_l - \Phi_F E_F - \Phi_T E_T}{E_l}$ ,

where $E_\lambda$ is the molar energy of the laser photons (355 nm), and $\Phi_F$ and $E_F$ the quantum

yield and average energy of fluorescence, respectively. $\Phi_T E_T$ is readily calculated from

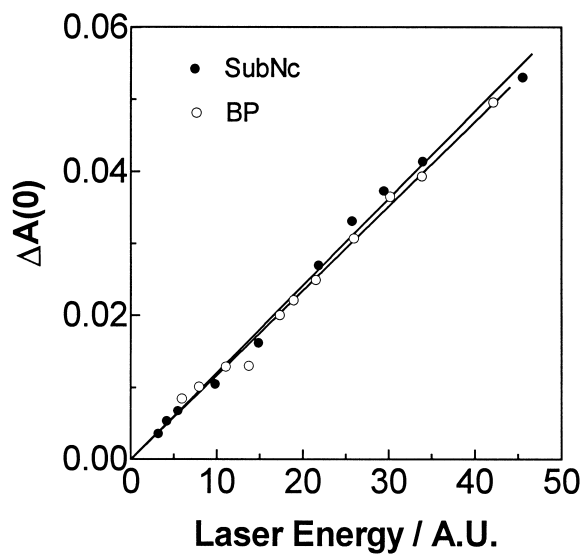this equation and is combined with the $E_T$ value to yield $\Phi_T$.

Fig.4. Laser-energy dependence of the zero-time absorbance change for optically-matched solutions of SubNc (in toluene, $\lambda_{obs}$ = 436 nm) and benzophenone (BP, in benzene, $\lambda_{obs}$ = 506 nm). The slopes of the straight lines are in the same ratio as the product of the triplet quantum yield times the triplet-minus-singlet absorption coefficient ($\Phi_T \Delta\varepsilon_{T-S}$). Using the value of $\Phi_T \Delta\varepsilon_{T-S}$ = 6300 $M^{-1}cm^{-1}$ at 506 nm for BP and the $\Phi_T$ value for SubNc obtained above, the value of $\Delta\varepsilon_{T-S}$ for SubNc at 436 is readily calculated.
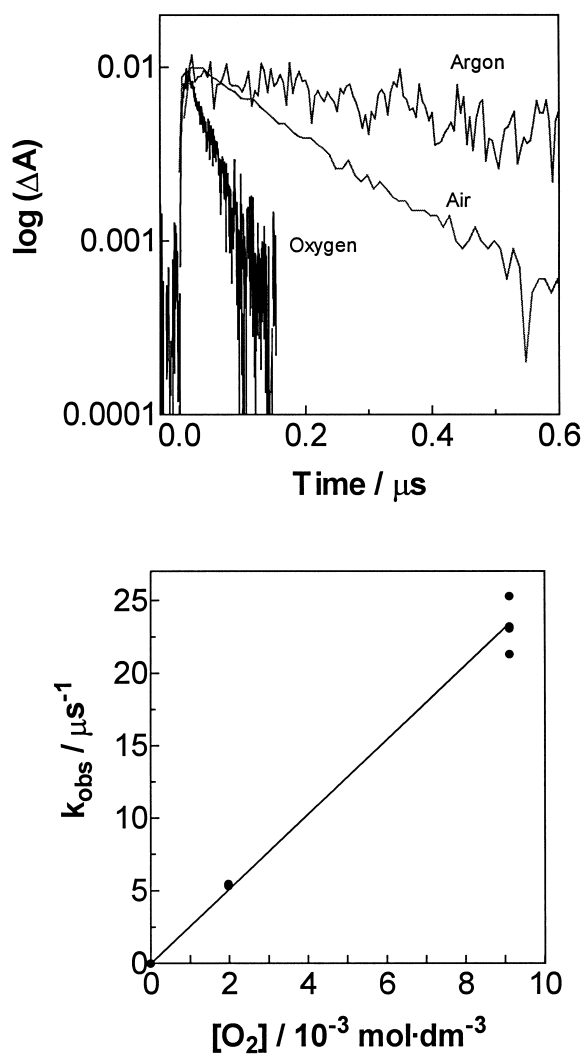
Fig.5. (**Top**) Triplet decay traces in argon, air- and oxygen-saturated toluene solutions of SubNc. $\lambda_{exc}$ = 355 nm; $\lambda_{obs}$ = 436 nm. (**Bottom**) Stern-Volmer plot for the triplet quenching by oxygen in toluene. The rate constant $k_q^{O2}$ was determined from the equation

$$k_{obs} = k_T(0) + k_q^{O2}[O_2],$$

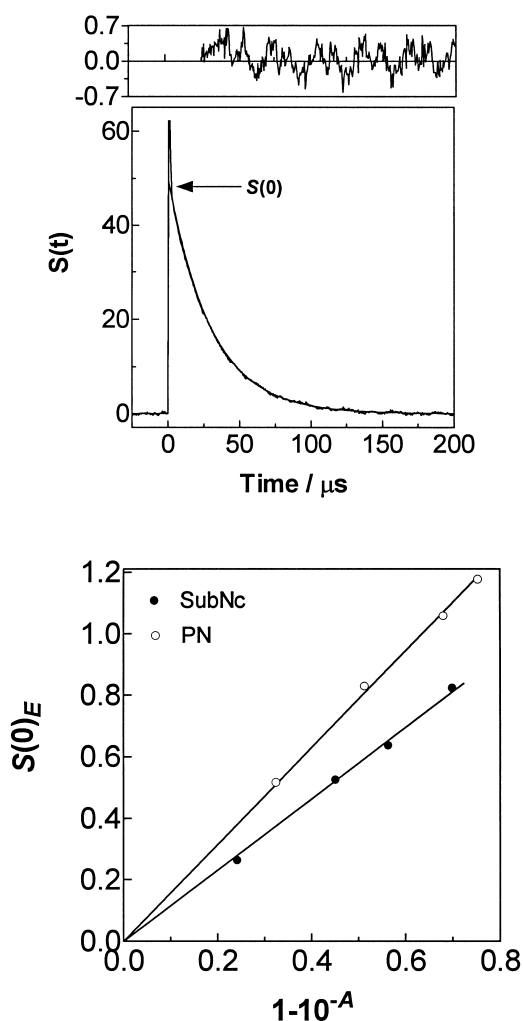where $k_T(0)$ is the triplet decay rate constant observed in argon-saturated solutions.

Fig.6. Determination of the singlet oxygen $O_2(^1\Delta_g)$ quantum yield, $\Phi_\Delta$, by time-resolved near-IR emission spectroscopy (TRNIR). (**Top**) Typical $O_2(^1\Delta_g)$ phosphorescence signal observed ($\lambda_{obs}$ = 1270 nm) upon 355 nm laser photolysis of SubNc in air-saturated toluene. The decay is monoexponential with lifetime 29 $\mu$s. (**Bottom**) The laser energy-normalized signal amplitude for SubNc and for the reference phenalenone (PN) is plotted as a function of the absorption factor ($1-10^{-A}$) for a series of solutions with different absorbance. The slopes of this lines are in the same ratio as the $\Phi_\Delta$ values for the two compounds.