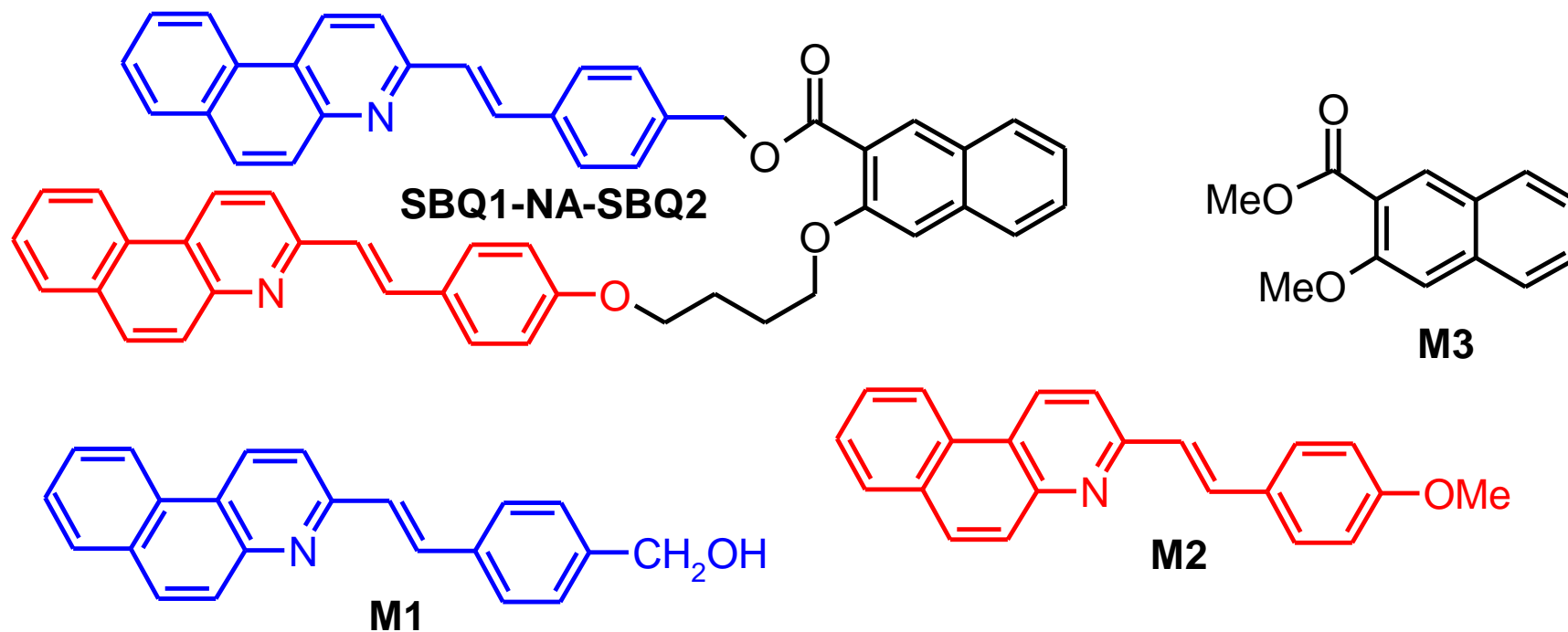


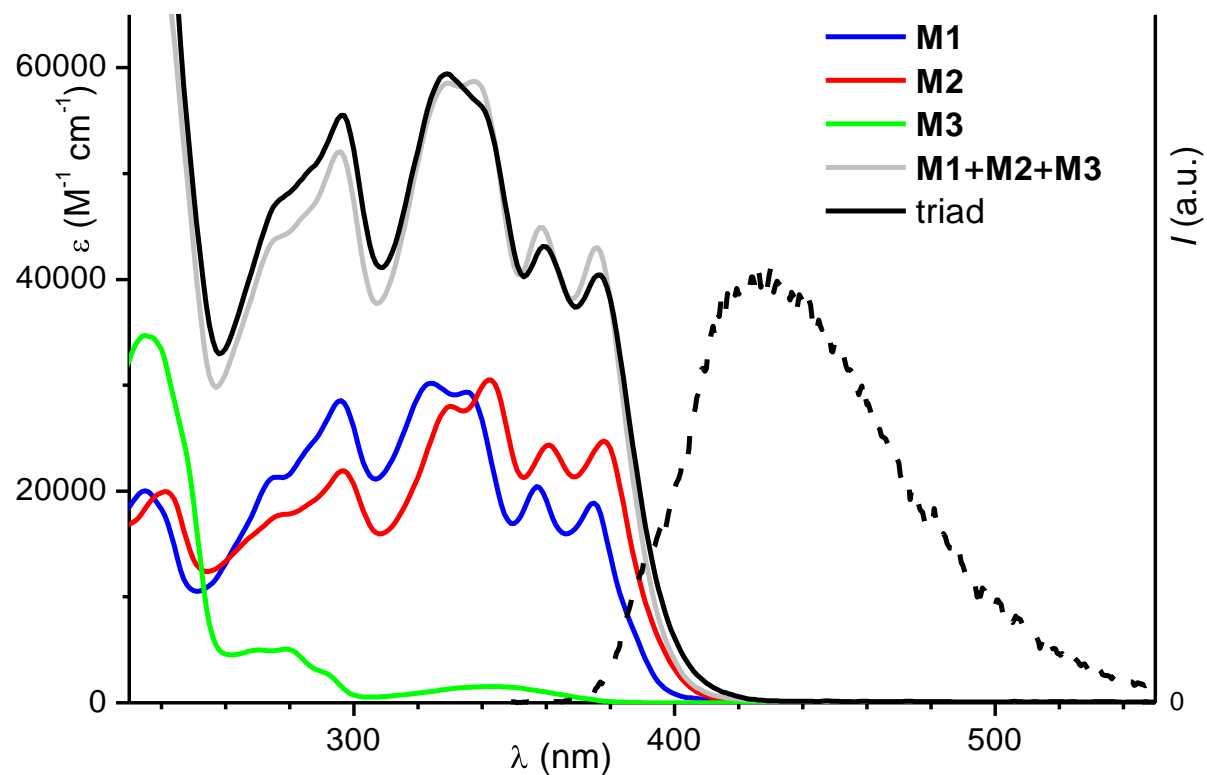
**Electronic energy transfer managing
reversible photoisomerization and [2+2]
photocycloaddition in bis-
styrylbenzoquinoline dyad**

N. I. Potashova, M. F. Budyka, T. N. Gavrishova,

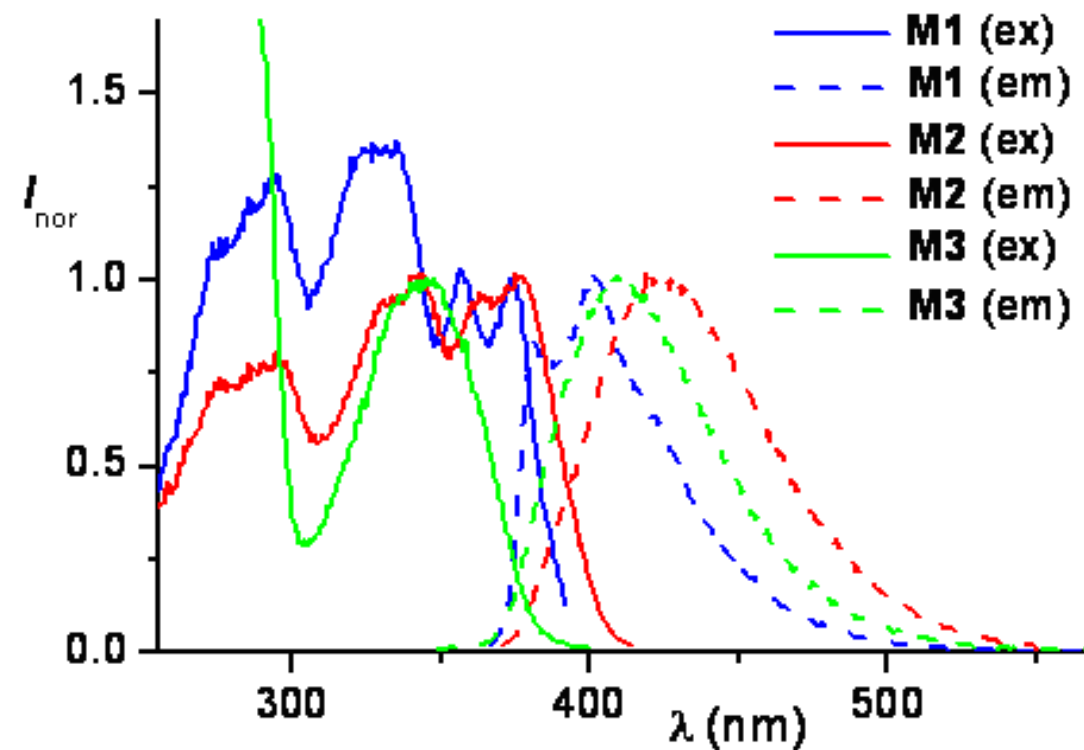
V. M. Li, E. N. Ushakov



Chemical structure of triad **SBQ1-NA-SBQ2** and model compounds **M1**, **M2** and **M3**; the SBQ photochromes are shown as *s-cis* rotamers.

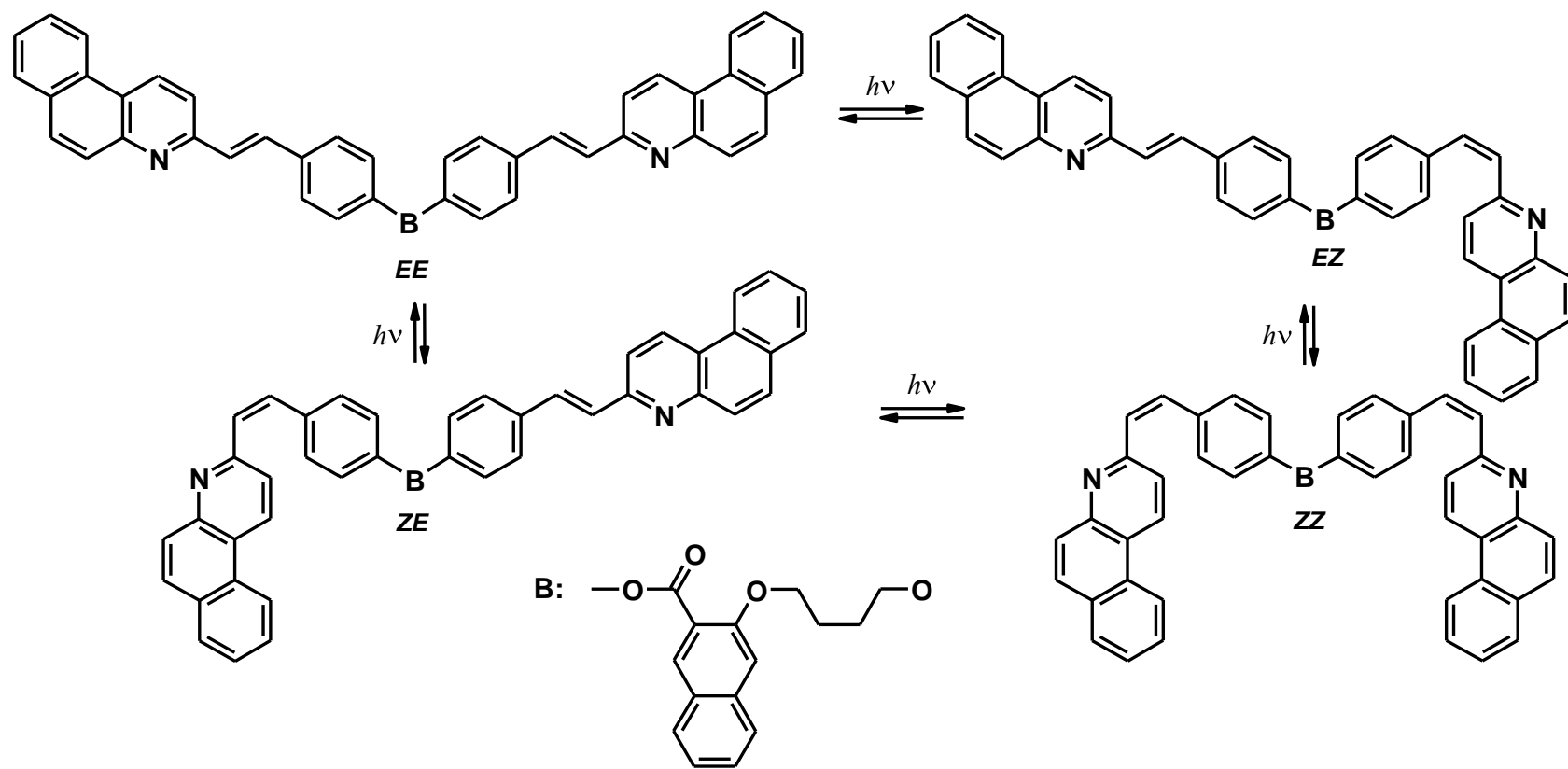


Absorption spectra (left axis, solid lines) of triad **SBQ1-NA-SBQ2** and model compounds **M1**, **M2** and **M3**, as well as the sum (**M1+M2+M3**); the triad fluorescence spectrum (right axis, dashed line, excitation at 339 nm).



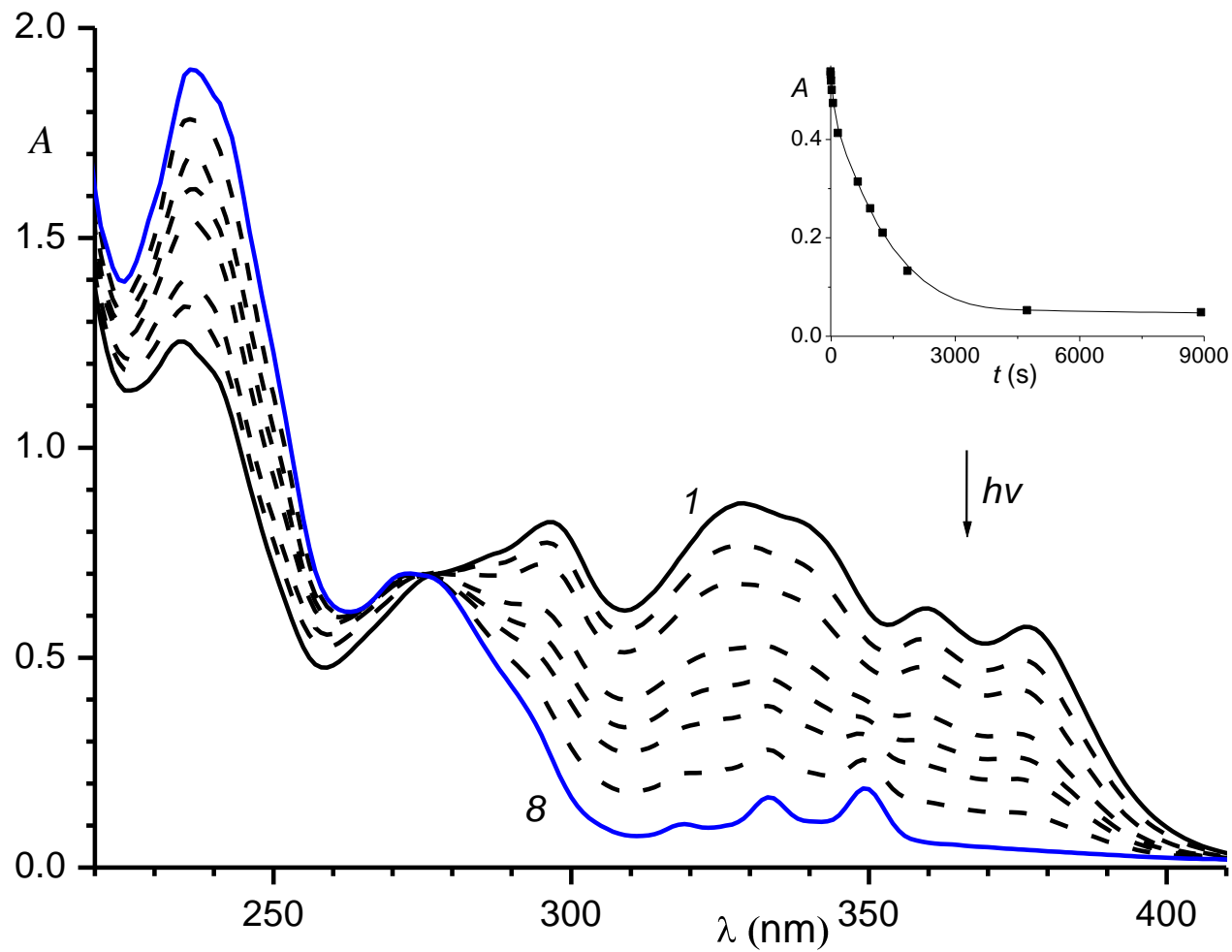
Normalized fluorescence and fluorescence excitation spectra of model compounds **M1**, **M2** and **M3**; the excitation and observation wavelengths (nm) are, respectively, 356 and 402 (**M1**), 361 and 424 (**M2**), 339 and 410 (**M3**).

the fluorescence quantum yield is equal to 0.051 for triad

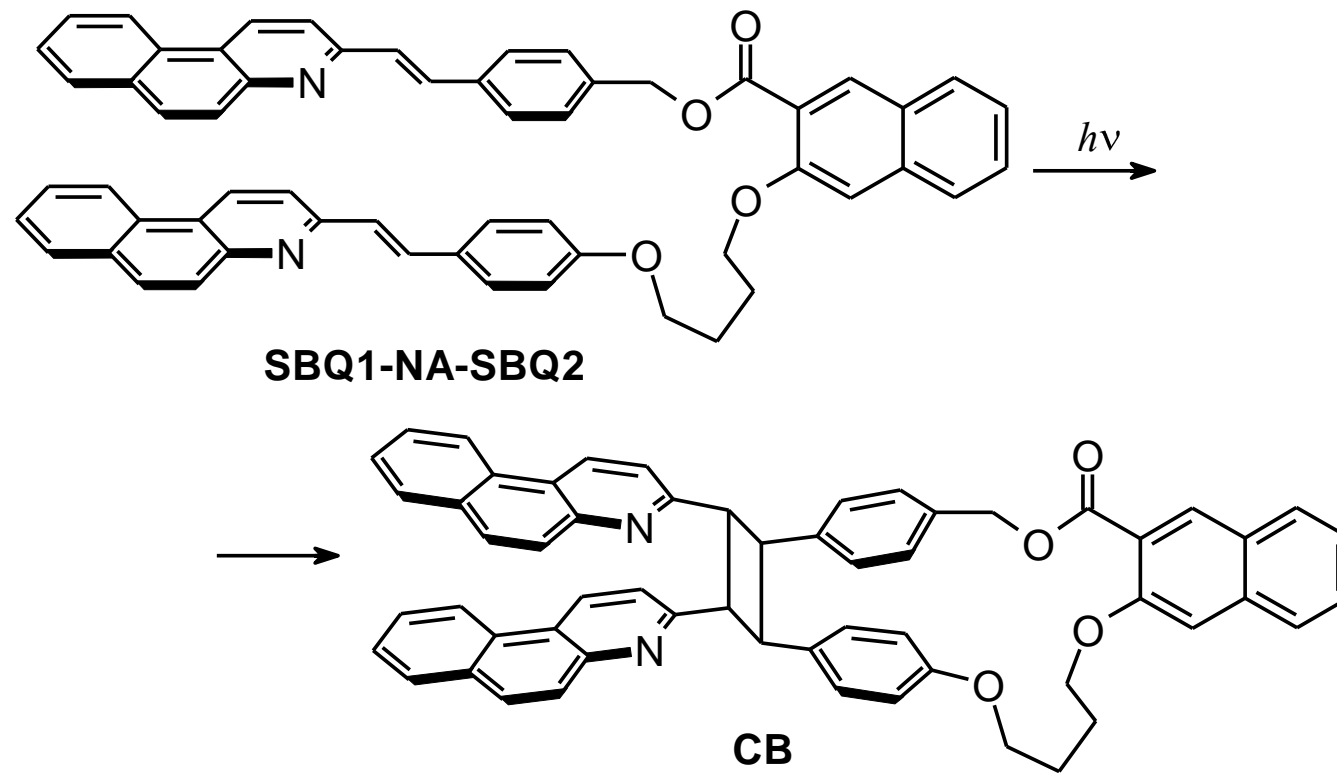


Photoisomerization pathways of the triad **SBQ1-NA-SBQ2**

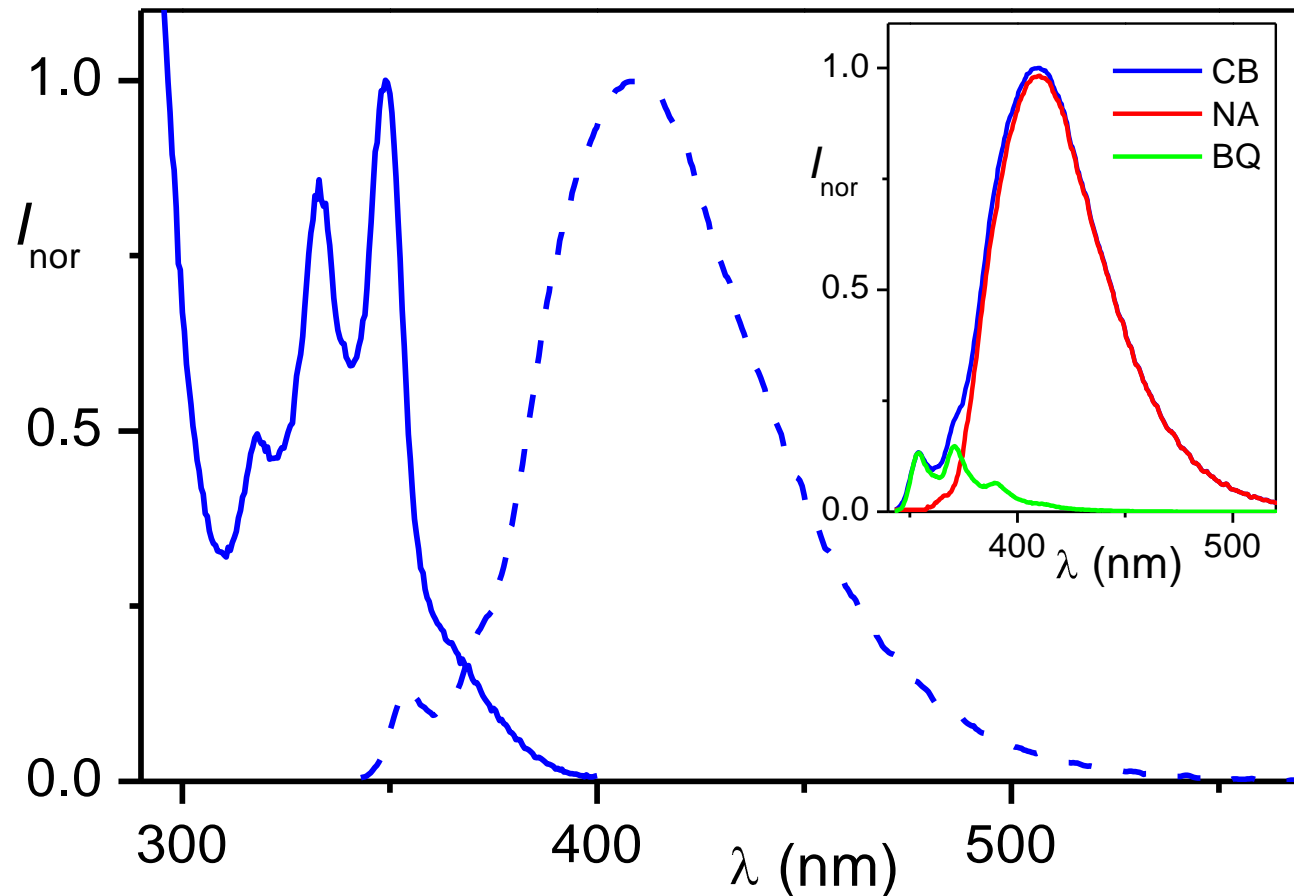
(on the example of the *s-trans* conformers of the SBQ photochromes).



Spectral variations during irradiation of an air-saturated solution of triad **SBQ1-NA-SBQ2** ($1.36 \times 10^{-5} \text{ M}$) with 371 nm light, intensity $5.5 \times 10^{-10} \text{ Einstein cm}^{-2} \text{ s}^{-1}$, total irradiation time is 8940 s (8).
Insert: kinetics of an absorbance change at 371 nm



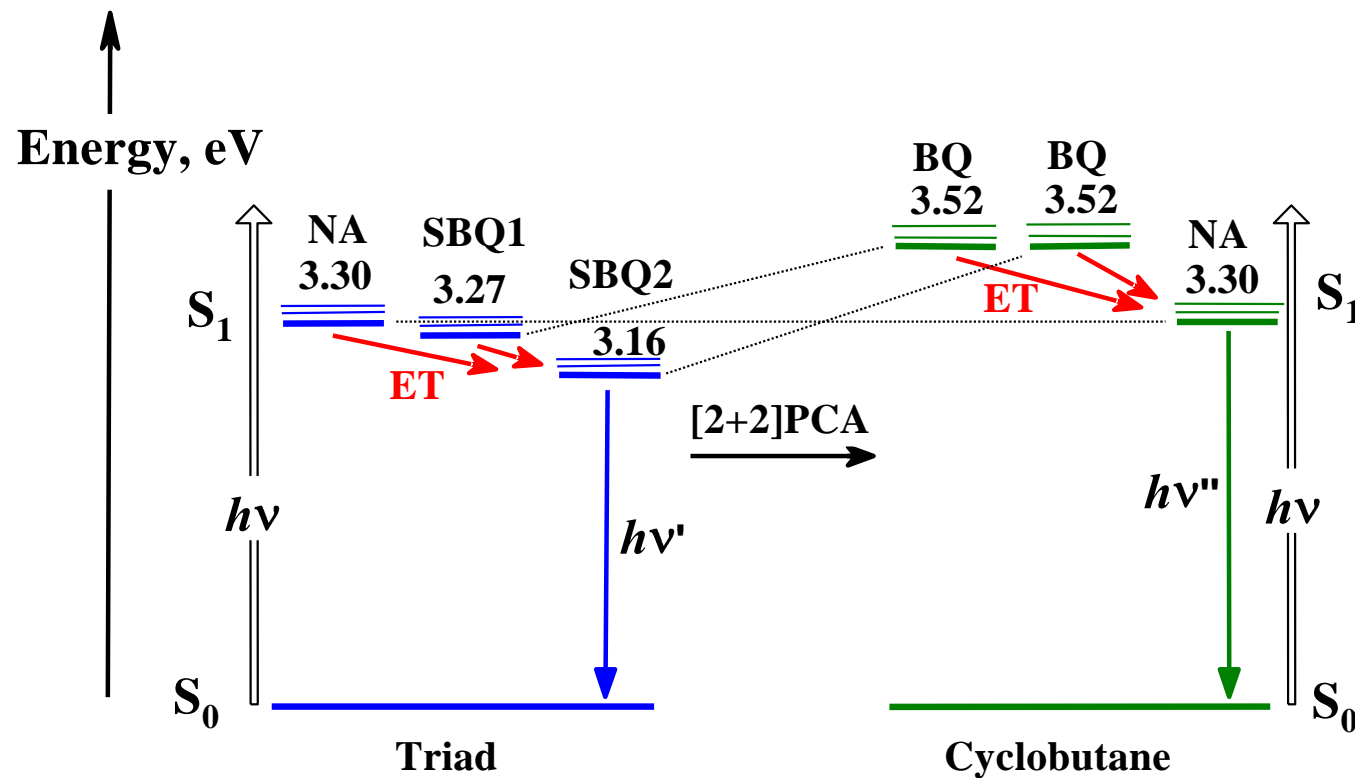
Reaction of [2+2] photocycloaddition of the triad **SBQ1-NA-SBQ2** with formation of the cyclobutane **CB**.



$\phi_{\text{fl}} = 0.018$ for **CB**

Normalized fluorescence (dashed line, excitation at 333 nm) and fluorescence excitation (solid line, observation at 410 nm) spectra of the cyclobutane **CB**.

Insert: decomposition of the **CB** fluorescence spectrum into the spectra of the NA and BQ subunits.



State energy diagram for triad **SBQ1-NA-SBQ2** and cyclobutane **CB**. The S_1 energies correspond to the 0-0 transitions calculated as intersections of the corresponding absorption and emission spectra. The processes corresponding to the light absorption and emission, ET and the (cross-)PCA reaction are also shown.

Thanks for attention