ULTRAFAST PHOTOPHYSICS OF SIMPLE AROMATIC CHROMOPHORES

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It is known that the photophysical properties of chromophores is decisively conditioned by the existence of $\pi\sigma^*$ transitions with repulsive character, in the vicinity of the characteristic bright $\pi\pi^*$ absorptions. The interplay between these two types of states triggers a complex dynamics that takes place in the femto-picoseconds scale.[a] Our group is interested in understanding the ultrafast relaxation mechanisms involving $\pi\sigma^*$ surfaces in a set of isolated aromatic chromofores including: aniline, indole, phenol and pyrrole. In the research carried out, the dynamical signature of the $\pi\sigma^*$ states has been tracked directly on the parent molecules photoexcited in a broad range of their near UV absorption specta, by multiphoton delayed ionization at several wavelengths. For the studied molecules, the work provides a detailed view on the relaxation pathways available, while permits to relate their photophysical behavior with the relative location of the $\pi\sigma^*$ and $\pi\pi^*$ states.

[a] W. . Domcke et. al., *Science*, **302**, 1693, 2003.