

Photoreactivity of PAHs as a function of the local hydrogen bonding environment, from isolated molecules to clusters and ices.

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The photoreactivity of aromatic molecules is key to the physics and chemistry in a wide range of environments. In the interstellar medium, polycyclic aromatic hydrocarbons are believed to account for a significant fraction of the carbon budget, and their propensity to undergo photodetachment, photofragmentation or emission (e.g. recurrent fluorescence) following photoexcitation will determine local physical and chemical conditions in diffuse environments. In media dominated by hydrogen bonding (solutions, clusters, ices), the photoreactivity of aromatics will be modified. For example, due to the ultrafast dynamics in their electronic excited states, small aromatics play the role of UV photoprotectors in the human body. Due to their ubiquity, and the wide range of relaxation timescales they demonstrate, aromatics are an interesting target for studying molecular dynamics in various hydrogen bonding environments. In this talk, I will review some recent experimental and theoretical studies of the photophysics of small aromatic molecules spanning experimental conditions from the gas phase to the solid phase and probing the role of parameters such as charge state, heteroatoms and functional groups in driving the UV-induced reactivity within these species.

Keywords

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