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Photo-processing of astro-PAHs

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The interaction of polycyclic aromatic hydrocarbons (PAHs) with UV irradiation is a key process in astrochemistry since it governs the heating of the gas by photoelectric effect and can contribute to the catalytic formation of molecules such as H₂ and C₂H₂. The fragmentation rate of these PAH species also determines their survival in astrophysical environments [1]. In this presentation, we show how we can combine the results of different experiments to obtain information on the branching ratios between the different fragments and on dissociation rates as a function of energy. These experiments include: -(i)- fragmentation of trapped PAH cations exposed to multiple photon absorption [2] or to synchrotron VUV light [3] and -(ii)- photoelectron spectroscopy performed on neutral PAHs under synchrotron irradiation [4]. We also report insights into the competition with other relaxation mechanisms, ionization and radiative cooling [5].

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Summary

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