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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 H_2 and C_2H_2. 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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References
[1] J. Montillaud, C. Joblin, D. Toublanc, Astron. & Astrophys. 552, id.A15 (2013).
[2] B. West, F. Useli-Bacchitta, H. Sabbah, V. Blanchet, A. Bodi, P.M. Mayer, and C. Joblin, J. Phys. Chem. A 118, 7824–7831 (2014).
[3] S. Rodriguez Castillo, A. Simon, C. Joblin, Int. J. Mass Spectrom. 429, 189-197 (2018).
[4] B. West, S. Rodriguez Castillo, A. Sit, S. Mohamad, B. Lowe, C. Joblin, A. Bodi, P. M. Mayer, Phys. Chem. Chem. Phys. 20, 7195-7205 (2018).
[5] J. Zhen, S. Rodriguez Castillo, C. Joblin, G. Mulas, H. Sabbah, A. Giuliani, L. Nahon, S.Martin, J.-P. Champeaux, P. Mayer, Astrophys. J., 822, id. 113 (2016).

Summary

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