Low Temperature Spectroscopy and Astrophysical Issues. The Interstellar Extinction

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The UV-to-NIR spectroscopic characteristics of neutral and ionized polycyclic aromatic hydrocarbons (PAHs) have been investigated using Matrix Isolation Spectroscopy (MIS). PAHs are considered very good candidates to account for the IR emission bands and the visible diffuse interstellar absorption bands (DIBs) seen in the interstellar medium. In the model dealing with the interstellar spectral features, PAHs, present as a mixture of radicals, ions and neutral species, are responsible for most of the IR spectral bands which are associated with UV-rich regions of space. Thus, it is crucial to assess their physical and chemical properties to understand how they influence the radiation and energy balance in space and the interstellar chemistry. A discussion of the physical and chemical conditions governing the production of ions in the interstellar medium and the implications for the role these species may play in the conversion of UV, visible and NIR interstellar radiation to infrared radiation is presented.

References: F. Salama in Low Temperature Molecular Spectroscopy, R. Fausto ed., NATO/ASI Series, Kluwer Acad. Pub., in press (1996); F. Salama, C. Joblin and L. Allamandola, J. Chem. Phys. 101, 10252 (1994); F. Salama and L. J. Allamandola, Nature 358, 42 (1992); ibid, J. Chem. Phys. 94, 6964 (1991).