ELECTRONIC SPECTROSCOPY OF CARBON CHAINS AND RELEVANCE TO ASTROPHYSICS

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The electronic spectra of a variety of carbon chanis, C_n, C_nH, HC_nH and their ions C_n^-, HC_nH^+ have been identified in neon matrices between 200 and 2500 nm. This has been achieved by mass-selected codeposition of ions with excess of neon to form a matrix at 5 K. The understanding of the electronic transitions of the carbon chains point out which type and sizes are relevant for astrophysical consideration, such as in relation to the diffuse interstellar bands. Infrared bands of some such mass-selected carbon species are also detectable. The technique has also been used to elucidate the formation of carbon chains in argon and neon matrices by diffusive coagulation on annealing.