MATRIX-ISOLATION SPECTROSCOPY OF POLYCYCLIC AROMATIC HYDROCARBON CATIONS AND ANIONS

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Polycyclic aromatic hydrocarbons (PAHs) are promising candidates for the origin of the diffuse interstellar bands (DIBs). Laboratory studies have shown that PAH cations absorb in the visible and the near-infrared region where the DIBs are observed. Although anionic PAHs may also exist in the interstellar medium,[a] the spectroscopy of negatively-charged PAHs in an astrophysically relevant environment has been largely unexplored. We report here the first studies of the electronic spectra of PAH anions isolated in neon matrices containing Na atoms. Emission features from the interstellar medium have also been recently attributed to PAHs containing excess H atoms (H_n-PAHs).[b] The UV/Visible spectroscopy of the H_n-PAHs 1,2,3,6,7,8-hexahydropyrene, 4,5-dihydropyrene, and 1,2-dihydroacenaphthylene and their photoproducts isolated in a neon matrix will also be reported.

[a] F. Salama, E. L. O. Bakes, L. J. Allamandola, ApJ, 458, 621, (1996).
[b] M. P. Bernstein, S. A. Sandford, and L. J. Allamandola, ApJ, 472, L127, (1996).