

ABSORPTIONS IN THE VISIBLE OF PROTONATED PYRENE COLLISIONALLY COOLED TO 15 K

C. A. RICE, FRANCOIS XAVIER HARDY, OLIVER GAUSE, JOHN P. MAIER, *Department of Chemistry, University of Basel, Basel, Switzerland.*

Protonated polycyclic hydrocarbons have been added to the list of suggested carriers of the diffuse interstellar absorptions. To test this proposition requires laboratory spectra measured under interstellar conditions, in particular with the rotational and vibrational degrees of freedom equilibrated to low temperatures. This has been achieved for protonated pyrene with absorption bands in the visible, using an ion trap and collisional cooling to ≈ 15 K. A two-photon excitation-dissociation scheme was employed to record the $(1) {}^1A' \leftarrow X {}^1A'$ electronic spectrum on around 10^5 ions per duty cycle. The origin band of the absorption spectrum of this relatively large polycyclic aromatic species with 27 atoms is located at 4858.86 Å. Two further comparably intense spectral features are present at 4834.48 and 4809.32 Å. This is one of the largest protonated aromatics studied in the gas phase and compared to astronomical observations; however, it is not a carrier of known diffuse interstellar bands.