EXPLORING THE VIBRATIONAL STRUCTURE OF THE VINYLIDENE ANION USING ARGON PREDISSOCIATION SPECTROSCOPY

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We report Ar-mediated vibrational spectra of the vinylidene anion, a relevant intermediate in various chemical processes, and its fully deuterated form in order to characterize the vibrational energy levels present in this species. Identification of the C-H asymmetric and symmetric stretching frequencies was made and confirmed by the deuterium isotope shift. This information could then be used to clarify the origin of two higher energy peaks around 4000 and 4200 cm^{-1} in the light isotope, which occur quite close to the photodetachment threshold. Preliminary analysis indicates their assignment to combination bands involving excitation of the C=C stretch along with the C-H fundamentals. The work was then extended to include the NNO molecule as a messenger species.