

INFRARED PHOTODISSOCIATION SPECTROSCOPY OF PROTONATED AMMONIA CLUSTERS IN THE GAS PHASE

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The clustering of protonated ammonia clusters, a known interstellar ion, are studied with infrared photodissociation spectroscopy in the region of 4700 to 7200 cm^{-1} . $\text{H}^+(\text{NH}_3)_n$ clusters up to $n=8$ are produced using a pulsed electrical discharge in a supersonic expansion. Mass-selected ions are investigated using tunable infrared laser photodissociation in the turning region of a reflectron time of flight mass spectrometer. Clusters of protonated ammonia are probed through the dissociative elimination of an ammonia. The spectra gathered were assigned by comparing to B2PLYP/def2-TZVP computations. Two bands are consistently observed for the studied protonated ammonia clusters. A band at around 5000 cm^{-1} is attributed to a combination of the N-H stretching and bending modes. Another band at around 6500 cm^{-1} is assigned to either an overtone or a combination of the N-H stretching modes.