

ROVIBRATIONAL SPECTROSCOPY OF THE CH⁺-He AND CH⁺-He₄ COMPLEXES

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A cryogenic 22-pole ion trap apparatus is used in combination with a table-top pulsed IR source to probe weakly bound CH⁺-He and CH⁺-He₄ complexes by predissociation spectroscopy at 4 K. The infrared photodissociation spectra of the C-H stretching vibrations are recorded in the range of 2720–2800 cm⁻¹. The spectrum of CH⁺-He exhibits perpendicular transitions of a near prolate top with a band origin at 2745.9 cm⁻¹, and thus confirms it to have a T-shaped structure. For CH⁺-He₄, the C-H stretch along the symmetry axis of this oblate top results in parallel transitions.