THE MICROWAVE ROTATIONAL SPECTRUM OF THE He-HCCCN VAN DER WAALS COMPLEX

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He-HCCCN is a T-shaped complex of the relatively simple ball-stick type. A high level *ab initio* potential energy surface (PES) for the interaction between a He atom and a HCCCN molecule was calculated. The global minimum of the PES was used as an initial estimate for geometry of the complex, allowing the prediction of rotational constants for the spectroscopic search. Low-J rotational transitions of the He-HCCCN complex were measured using a high-resolution Fabry-Perot cavity Fourier transform microwave spectrometer in the 4-27 GHz frequency range. The ^{14}N nuclear quadrupole hyperfine structures of the rotational transitions were resolved, assigned, and analyzed. Information about the structure and dynamics of the He-HCCCN complex will be presented. The characterization of He-HCCCN is the ground work for subsequent spectroscopic studies of higher He$_n$-clusters.