FIRST INFRARED SPECTRA OF CN-RARE GAS AND CN-H_2/D_2 COMPLEXES VIA IR-UV FLUORESCENCE DEPLETION SPECTROSCOPY[a]

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In this study, an IR-UV fluorescence depletion scheme is employed to record rotationally resolved IR spectra in the CN overtone region of CN-Ne, CN-Ar, and CN-H_2/D_2 using previously reported *B-X* electronic transitions. The resulting IR spectra are fit to yield band origins and rotational constants for the lower and upper states. The band origins for all four species are shifted only slightly from the CN monomer overtone stretch, which reflects the weak nature of the van der Waals interactions. In the case of CN-Ar and CN-D_2, the derived rotational constants are consistent with equilibrium distances from ab initio potential energy surfaces. However, for CN-Ne and CN-H_2, Coriolis coupling between nearby hindered rotor states complicates the rotational analysis. Ongoing work using an alternate IR-UV double-resonance technique will help elucidate the nature of the interaction and the average configuration of the ground states of the four species.

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