INFRARED-MICROWAVE DOUBLE RESONANCE SPECTROSCOPY OF Ar-DF ($\nu = 0, 1, 2$)

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The van der Waals complex between argon and DF in $\nu = 0$, 1, and 2 has been studied by infrared-microwave double resonance spectroscopy using both an 11 GHz broadband CP-FTMW spectrometer and a cavity FTMW spectrometer. The rotational constant and deuterium quadrupole coupling constant of this complex were experimentally determined for the ground state and five excited vibrational states of this complex. It was found that adding energy to the DF stretching mode increased both the B rotational constant and the quadrupole coupling constant, indicating a decrease in the vibrationally averaged angle between DF and the *a* inertial axis of the complex, while adding energy to the van der Waals stretching mode decreased both the rotational constant and the quadrupole coupling constant. States with energy in the bending mode will also be discussed. These results will also be compared to previous experimental and theoretical work.