ROVIBRATIONAL SPECTROSCOPY AND MOLECULAR DYNAMICS OF Ar-HBr

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High resolution rovibrational spectra of several bands associated with the ν_1 (HBr stretch) of both Ar-H^{79}Br and Ar-H^{81}Br isotopomers have been recorded using a tunable infrared diode laser supersonic jet spectrometer. In addition to the ν_1 fundamental, the combination bands $\nu_1 + 2\nu_2^0$, $\nu_1 + \nu_2^1$, $\nu_1 + \nu_3$, $\nu_1 + 2\nu_2^0 + \nu_3$, the hot band $\nu_1 + 2\nu_2^0 - 2\nu_2^0$, and the difference band $\nu_1 - 2\nu_2^0$ were observed and analyzed. Nuclear quadrupole splittings have been partially resolved in Q branch transitions of the $\nu_1 + \nu_2^1$ band. A strong Coriolis perturbation between the $\nu_1 + \nu_2^{1e}$ and $\nu_1 + \nu_3$ was observed and analyzed. These results have been incorporated to determine an improved H4 intermolecular potential for Ar-HBr. In addition, the intermolecular potential surface for the Ar-HBr with HBr in its $v = 1$ state has also been modeled based on the experimental results of this work.