TESTING THE MORPHED POTENTIAL OF Ar-HBr USING TAMU COAXIAL PULSE JET SUB-MILLIMETER WAVE FAST SCAN SPECTROMETER WITH A FREQUENCY AND PHASE STABILIZED BWO

BLAKE A. MCELMURRY, JOHN W. BEVAN, ROBERT R. LUCCHESE, *Department of Chemistry, Texas A&M University, College Station, TX 77843-3255*; IGOR I. LEONOV, *Institute of Applied Physics of Russia Academy of Sciences, Uljanova Str. 46, Nizhny Novgorod 603600, Russia*.

The lowest frequency Σ bending vibrations of Ar-H^{79}Br and Ar-H^{81}Br have been recorded using TAMU fast scan BWO spectrometer with co-axial supersonic jet expansion. The fitted band origin was $\nu_0 = 329611.4482(16)$ MHz, the excited state rotational constant was $B = 1236.41359(22)$ MHz, the distortion constants were $D_J = 0.0124740(36)$ MHz and $H_J = -2.503(17) \times 10^{-6}$ MHz and the quadrupole constants were $\chi_{aa} = 260.9552(79)$ MHz and $D_{\chi_{aa}} = -0.03174(35)$ MHz for Ar-H^{79}Br. The corresponding constants for Ar-H^{81}Br were: $\nu_0 = 329225.6995(15)$ MHz, $B = 1226.77332(22)$ MHz, $D_J = 0.0123085(37)$ MHz, $H_J = -2.459(19) \times 10^{-6}$ MHz, $\chi_{aa} = 217.8952(75)$ MHz, and $D_{\chi_{aa}} = -0.02619(36)$ MHz. The values of χ_{aa} and $D_{\chi_{aa}}$ can be compared with the corresponding values predicted from a recently modeled complete vibrationally morphed potential of Ar-HBr and used for further optimization of that potential.