

THE GROUND STATE FOUR DIMENSIONAL MORPHED POTENTIALS OF HBr AND HI DIMERS

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The assigned rotational-tunneling transitions including quadrupole substructure of $\text{H}^{79}\text{Br}-\text{H}^{81}\text{Br}$ are combined with previously recorded rovibrational infrared and microwave data, to provide a basis for optimizing a ground state four-dimensional morphed potential with quantifiable uncertainties. The determined potential minimum has a value $V = -644.0 \text{ cm}^{-1}$ at the geometry $R = 4.04 \text{ \AA}$, $\theta_1 = 16.9^\circ$, $\theta_2 = 108.3^\circ$, and $\phi = 180.0^\circ$. The peak of the minimum energy path between the two equivalent minima occurs at $V = -571.2 \text{ cm}^{-1}$, leading to a barrier height of 72.8 cm^{-1} . A corresponding investigation for the HI dimer will also be presented.