TORSIONAL ANALYSIS OF METHANOL IN THE OH VIBRATIONAL MANIFOLD UP TO $v_{OH} = 6$

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Torsional analyses of OH overtone bands of methanol, including v_{OH} = 2, 3, 5, and 6, are reported. The rotationally resolved spectra at each level were obtained in Lausanne by double resonance excitation and IRLAPS (infrared laser-assisted photodissociation spectroscopy) detection. The data reveal approximately regular torsional energy patterns with a monotonically decreasing K = 0 torsional tunnelling splitting from 9.1 cm^{-1} on the ground state to 1.6 cm^{-1} at v_{OH} = 6. The torsional tunnelling splittings, together with two different models for the vibrational dependence of the torsional moment of inertia, are used to estimate the torsional barrier heights. The data are consistent with an approximately linear increase in the torsional barrier height from 373 cm^{-1} in the ground state to 612 or 644 cm^{-1} at v_{OH} = 6.