

## FOURIER TRANSFORM SPECTRA AND INVERTED TORSIONAL STRUCTURE FOR A CH<sub>3</sub>-BENDING FUNDAMENTAL OF CH<sub>3</sub>OH

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The high-resolution Fourier transform spectrum of CH<sub>3</sub>OH has been investigated in the 1400-1650 cm<sup>-1</sup> region, containing the CH<sub>3</sub>-bending fundamental bands. Twenty-two perpendicular  $\Delta K = +1$  subbands have been identified so far, with origins ranging from 1490 to 1570 cm<sup>-1</sup> for transitions  $K = 2 \leftarrow 1$  up to  $11 \leftarrow 10$  for various torsional symmetries. Assignment of the subbands to the  $\nu_4$  in-plane ( $A'$ ) or  $\nu_{10}$  out-of-plane ( $A''$ ) asymmetric methyl-bending modes is not yet clear, but the one subband so far observed with resolved  $K$ -doublet structure suggests  $c$ -type selection rules consistent with a  $\nu_{10}$  vibrational assignment. The pattern of the  $K$ -reduced torsion-vibration energy  $\tau$ -curves is inverted compared to the normal 1-dimensional picture for  $n = 0$  torsional levels, in agreement with prediction based on fitting torsional variation of *ab initio* CH<sub>3</sub>-bending frequencies to a local mode model. However, the periodicity of the curves is unusual and significantly different from the ground state. The vibrational energy for the bending mode is 1481 cm<sup>-1</sup>, and the mean  $B$ -value is 0.008 cm<sup>-1</sup> higher than that of the vibrational ground state.