A SIMULTANEOUS FIT OF THE TORSION-WAGGING-ROTATIONAL LEVELS FROM THE EXCITED (V_t = 0, 1 and 2) STATES OF METHYLAMINE USING A HYBRID (TUNNELING AND NON-TUNNELING) HAMILTONIAN FORMALISM

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We used our hybrid program[a] to fit an extended dataset consisting of almost 30000 rotational-torsionial-wagging transitions in the MW and FIR of v_t = 0, 1 and 2 of CH_3NH_2. The program can fit rotational levels in molecules with one CH_3 internal-rotation large-amplitude motion, one NH_2 inversion large-amplitude motion. Our data set contains around 3000 MW and 26848 FIR transitions, which are fit to a weighted standard deviation of 1.75 using 102 parameters. Most of the FIR transitions are taken from recent measurements of the v_t = 1-0 band centered near 265 cm-1[b], and the ground torsional state transitions are from Motiyenko et al.[c]. Around new 340 and 176 microwave transitions were also assigned in the v_t = 1-1 and v_t = 2-2 states respectivelly. We hope to be able to fit all this data simultaneously with the far-infrared data from v_t = 2-1, 2-0 and 2-2[d].

[a] I. Kleiner and J. T. Hougen, J. Mol. Spectrosc., 368, 111255 (2020)

[b] I. Gulaczyk, M. Kreglewski, V.-M. Horneman, J. Mol. Spectrosc. 342 (2017) 25-30

[c] R.A. Motiyenko, V.V. Ilyushin, B.J. Drouin, S. Yu, L. Margulès, Astron.Astrophys. 563 (2014) A1

[d] Part of this work has been funded by the Programme National de Physique Chimie du Milieu Interstellaire (PCMI) and French ANR Labex CaPPA through the PIA under Contract No. ANR-11-LABX-0005-01