THE ROTATIONAL SPECTRUM OF THE METHANOL ISOTOPOLOG $CH_3^{17}OH$ UP TO 1.1 THz

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Numerous isotopic species of methanol have been detected in the warm parts of star-forming regions. We have started a program to investigate their rotational spectra to facilitate searches for these in space and, in the longer run, to tackle the issue of torsion-vibration interaction that has hampered quantitative analyses of CH_3OH and its isotopologs beyond $v_t = 2$.

After CD_3OH,[1] CD_3OD (submitted), and CH_3OD (in preparation), we embarked on a study of the rotational spectrum of $CH_3^{17}OH$ employing a sample enriched in ^{17}O to 20%. The ^{17}O quadrupole splitting is usually quite well resolved at low values of J. Asymmetric broadening through this splitting can affect transitions with high rotational quantum numbers and at high frequencies. The assignments were comparatively straightforward despite the very limited previous data in the literature.[2] Thus far, we have assigned extensively a- and b-type transitions in $v_t \leq 1$ and got a fit with weighted rms deviation of 1.1 for 1540 measured line frequencies with J $\leq$ 40. As in the previous cases, we expect perturbations in $v_t = 2$ through torsion-torsion interaction with higher torsional states to prevent a global treatment of $v_t \leq 2$ within experimental uncertainties. The analysis is carried out applying the rho axis method and the RAM36hf program code.[3]

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