THE LABORATORY ROTATIONAL STUDY OF METHYL ISOCYNATE

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Methyl isocyanate (CH_3NCO) is one of the most abundant species detected on the surface of the 67P/Churyumov-Gerasimenko comet.[a] It has also been discovered in space towards the Orion clouds where a large number of rotational lines arising from energy levels with $K \leq 3$ were reported.[b] In the present work, Stark-modulation spectroscopy was used to record the room temperature rotational spectrum of CH_3NCO in the spectral region from 32 to 90 GHz and to assign rotational transitions up to $K = 10$. These new assignments were subsequently followed up to 364 GHz. Also, first laboratory measurements between 50 and 300 GHz have been performed for $CH_3N^{13}CO$ and $^{13}CH_3NCO$ isotopologues. Updated extensive line lists along with new sets of spectroscopic parameters provided in this work meet the needs for further detections of CH_3NCO in space.

[a] Goesmann, F., Rosenbauer, H., Bredehoft, J.H., et al. 2015, Science, 349, aab0689.
[b] Cernicharo, J., Kisiel, Z., Tercero, B., et al. 2016, A&A, 587, L4.