FOURIER TRANSFORM INFRARED SPECTROSCOPY OF CH_3OO RADICAL IN MID-INFRARED RANGE

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A mid-infrared spectrum of the CH_3OO radical at room temperature has been measured by Fourier-transform infrared spectroscopy. The CH_3OO radicals were produced by photolysis of a CH_3I/O_2 mixture at 248 nm or a CH3COCH3/O2 mixture at 193 nm; the total pressure is 100 Torr and the precursor is about 1.6-2.0%. The ν_2, ν_5, ν_6, ν_7, and ν_9 fundamental bands with origins at 2954.0, 1182.6, 1118.0, 910.8, and 3021.4 cm^{-1} have been observed, which are in good agreement with previous low-resolution work.[a] Particular attention has been given to simulate the rotational structure of the ν_2 band. Sequence band structure from the methyl torsion mode ν_{12} was included in the simulation of this band as well as some transitions from the precursor. The simulation shows generally good consistency with the experimental spectrum and allows the determination of the molecule's rotational constants.

[a] D.-R. Huang, L.-K. Chu, and Y.-P. Lee *J. Chem. Phys.* **127**, 7 (2007)