

THE TORSIONAL FUNDAMENTAL BAND AND ROTATIONAL SPECTRA UP TO 940 GHz OF THE GROUND, FIRST AND SECOND EXCITED TORSIONAL STATES OF ACETONE

V. ILYUSHIN, IULIIA ARMIEIEVA, OLGA DOROVSKAYA, E. A. ALEKSEEV, *Radiospectrometry Department, Institute of Radio Astronomy of NASU, Kharkov, Ukraine*; MARCELA TUDORIE, *Service de Chimie Quantique et Photophysique, Université Libre de Bruxelles, Brussels, Belgium*; R. A. MOTIYENKO, L. MARGULÈS, *Laboratoire PhLAM, UMR 8523 CNRS - Université Lille 1, Villeneuve d'Ascq, France*; OLIVIER PIRALI, *AILES beamline, Synchrotron SOLEIL, Saint Aubin, France*; BRIAN DROUIN, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*.

A new global study of the acetone ( $\text{CH}_3$ )<sub>2</sub>CO spectrum is reported. The new microwave measurements covering the frequency range from 34 GHz to 940 GHz have been carried out using spectrometers in IRA NASU (Ukraine) and PhLAM Lille (France). The far infrared spectrum of acetone has been recorded on the AILES beamline of the synchrotron SOLEIL using a Fourier transform infrared spectrometer coupled to a long path cell. The transitions belonging to the three lowest torsional states as well as to the observed fundamental band associated with the methyl-top torsion mode ( $\nu_{17} = 1$ ) have been analyzed using recently developed model for the molecules with two equivalent methyl rotors and  $\text{C}_{2v}$  symmetry at equilibrium (PAM\_C2v\_2tops program)<sup>a</sup>. The dataset consisting of more than 26100 microwave and 1100 FIR line frequencies and including transitions with  $J$  up to 89 was fit using a model consisting of 119 parameters and weighted root-mean-square deviation of 0.89 has been achieved. In the talk the details of this new study will be discussed.

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<sup>a</sup>V. Ilyushin, J.T. Hougen *J. Mol. Spectrosc.* 289 (2013) 41-49.