OZONE : FIRST OBSERVATION OF THE $2\nu_1$+$3\nu_2$+ν_3 BAND

A. BARBE, *Groupe de Spectrométrie Moléculaire et Atmosphérique, U.M.R. CNRS 6089, Université de REIMS, Moulin de la Housse, B.P. 1039, 51687 REIMS cedex 2, FRANCE*; M.-R. DE BACKER-BARILLY, X. THOMAS, P. VON DER HEYDEN, VL.G. TUYTEREV, *Groupe de Spectrométrie Moléculaire et Atmosphérique, U.M.R. CNRS 6089, Université de REIMS, Moulin de la Housse, B.P. 1039, 51687 REIMS cedex 2, FRANCE.*

This work continuous the systematic study of ozone in the infrared. Thanks to available predictions of band centres and rotational constants [a] and the improvement of signal/noise ratios of observed spectra, we are able to observe weaker and weaker bands. It is the case of the $2\nu_1$+$3\nu_2$+ν_3 band, which lies in the 5160 cm^{-1} spectral range. The spectrum has been recorded with the FTS of GSMA [b], with a path length of 36 metres and a pressure of 41.0 Torr. The transitions are derived with a precision better than 1×10^{-3} cm^{-1} for wavenumbers and 10% for the intensities.
The analyse has been performed using effective Hamiltonian, and transition moment operators.
430 transitions have been assigned, with $J = 34$, $Ka = 11$. They are reproduced with an rms = 2×10^{-3} cm^{-1}, close to the experimental accuracy. Only one level (24_3) has found to be slightly perturbed (Obs-Calc=-0.011 cm^{-1}). The perturber has easily been identified, as the 24_2 level of the (302)state. It is particularly interesting that this level was known, derived from our analyse of the (302)-(001) band [c], with a shift (Obs-Calc=+0.011 cm^{-1}), confirming the validity of both analyses.
We present here the results, with spectroscopic parameters (including the resonance with the (302) state, effective transition moment operators, integrated band intensities, portion of created linelists available for databanks and examples of agreements between observed and calculated spectra.
This work is financially supported by VAMDC EU Project

[a] Vl.G. Tyuterev, S.A. Tashkun, D.W. Schwenke, P. Jensen, T. Cours, A. Barbe, M. Jacon, *Chem. Phys. Letter*, 316, 271-279, (2000).
[b] L. Régalia, *Thesis Reims*, (1996).
[c] M.-R. De Backer-Barilly, A. Barbe, Vl.G. Tyuterev, *Molecular Physics*, 102, 1707-1716, (2004).