NEW HIGH RESOLUTION ANALYSIS OF THE ν_8+ν_9 BAND OF $H^{14}NO_3$ BY FOURIER TRANSFORM SPECTROSCOPY

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Using new Fourier transform spectra recorded at high resolution at Denver, in the 1100-1300cm^{-1} spectral range, it has been possible to perform a new and more extended study of the ν_8+ν_9 band of HNO_3. [a] [b] Actually, more than 4400 lines belonging to the ν_8+ν_9 band could be assigned up to high J and K_a values (J$\leq$75 and $K_a \leq$45), leading to the determination of 1700 infrared energy levels of the v_8=v_9=1 state. As in the recent infrared analysis of the ν_8+ν_9 band performed by Wang[b] the Fermi-type resonance coupling the rotational levels of the v_8=v_9=1 vibrational state with those of the v_6=v_7=1 "dark state" was explicitly taken into account during the energy levels calculations. This allowed to reproduce the infrared levels to within their experimental accuracy. However, it should be pointed out that when dealing with the microwave measurements [c] within ν_8+ν_9 , some microwave lines could not be calculated properly. Finally the determination of the A- and B-type components of the transition moment operator of the ν_8+ν_9 band was performed from a least squares fit calculation performed on experimental line intensities measured in the spectrum.

[a] A. Maki, J. Mol. Spectrosc. 136, 105 (1989).
[b] W. F. Wang, P. P. Ong, E.C. Looi and H.H. Teo, J. Mol. Spectrosc. 183, 407 (1997).
[c] T. M. Goyette and F.C. De Lucia, J. Mol. Spectrosc. 139, 241 (1990).