NEW HIGH RESOLUTION ANALYSIS OF THE $\nu_8+\nu_9$ 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 $\nu_8+\nu_9$ band of HNO_3. [a] [b] Actually, more than 4400 lines belonging to the $\nu_8+\nu_9$ 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 $\nu_8+\nu_9$ 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 $\nu_8+\nu_9$, 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 $\nu_8+\nu_9$ band was performed from a least squares fit calculation performed on experimental line intensities measured in the spectrum.

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[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).