Pressure shifts in the ν_3-band of NO_2 induced by collisions with noble gases, N_2, H_2, D_2, O_2, CO_2, and SO_2

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Very high resolution (0.0005 cm^{-1}) infrared spectra of NO_2 have been recorded with a pulse driven diode laser spectrometer. The 1600 cm^{-1} region corresponding to the ν_3-band has been analysed. 34 lines ($6 \leq N'' \leq 38$, $0 \leq K''_a \leq 11$), with NO_2 pressure varying from 0.1 to 0.5 Torr and foreign gas (Xe, Kr, Ar,...) from 100 to 220 Torr were recorded, using a Herriot cell of 4.7 m pathlength due the weakness of lines. The results clearly shows (within experimental accuracy) a notable variation of shift with respect to N'' quantum number, the shifts being larger in negativ magnitude for big N''. One can also note that the values of shifts are not systematically lower for molecules with higher broadening coefficients as it is for H_2O[a]. The similarities and differences between H_2O and NO_2 will be discussed.

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[a]B.Grossmann and E.Browell, *J.Mol. Spectrosc.* **138**, 562 (1989)