

PRESSURE BROADENING IN THE $^{13}\text{C}^{16}\text{O}$ 2–0 BAND

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N_2 induced pressure broadening in the $^{13}\text{C}^{16}\text{O}$ 2–0 band around 4167 cm^{-1} was investigated using Fourier Transform Spectroscopy. The spectra were recorded with a sample of 99 % isotopically pure ^{13}CO in a White-type absorption cell at a resolution of 0.005 cm^{-1} . Voigt profiles convolved with the FTS apparatus function were fitted to the observed lineshapes^a, and Lorentzian HWHM were determined as function of N_2 pressure. Pressure broadening coefficients for m between -33 and $+34$ were obtained with uncertainties of 5.8 %.^b The results are compared to N_2 broadening coefficients obtained from simultaneous measurements in the 2–0 band of $^{12}\text{C}^{16}\text{O}$. While the latter values agree well with those published earlier, those of $^{13}\text{C}^{16}\text{O}$ are systematically lower by 5–7 % compared to $^{12}\text{C}^{16}\text{O}$. This indicates that in spectroscopic databases the pressure broadening of $^{13}\text{C}^{16}\text{O}$ is significantly overestimated. This is most important since recent work^c shows that the $^{13}\text{CO}/^{12}\text{CO}$ mixing ratio is an indicator of stratospheric O_3 depletion chemistry.

^aK. Chance, Smithsonian Center for Astrophysics, Cambridge, USA, personal communication (1995).

^bS. Voigt et al., *J. Mol. Spectrosc.* 180, 359 (1996).

^cC. A. Brenninkmeijer et al., *Geophys. Res. Lett.* 23 (16), 2125 (1996).