AIR-BROADENED LINE PARAMETERS FOR THE 2←0 BANDS OF $^{13}C^{16}O$ AND $^{12}C^{18}O$ AT 2.3 μm

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Air-broadened line shape parameters were determined for the first time in the 2←0 bands of $^{13}C^{16}O$ near 4166.8 cm^{-1} and $^{12}C^{18}O$ near 4159.0 cm^{-1}. Spectra were recorded at 0.005 cm^{-1} resolution using a coolable absorption cell[a] in the sample compartment of the Bruker IFS 125HR Fourier transform spectrometer at Jet Propulsion Laboratory. Gas temperatures and pressures ranged from 150 to 298 K and 20 to 700 Torr, respectively. Line parameters were determined by broad-band multispectrum least-squares fitting[b] of the 4000-4360 cm^{-1} region in 16 spectra simultaneously; each set included 4 isotope-enriched pure sample scans and 12 air+CO samples (^{13}CO or $C^{18}O$, as appropriate). The air-broadened parameters measured were Lorentz half-width coefficients, their temperature dependence exponents; pressure-induced shift coefficients, their temperature dependences; and off-diagonal relaxation matrix elements. Speed dependence parameters were included to minimize the fit residuals. For both isotopologues the individual line positions and intensities were constrained to their theoretical relationships in order to obtain the rovibrational (G, B, D, and H) and band intensity parameters, including Herman-Wallis coefficients[c]. The results for $^{13}C^{16}O$ and $^{12}C^{18}O$ are compared with those for the $^{12}C^{16}O$ 2←0 band[d] and discussed.[e]

[a] K. Sung, A. W. Mantz, M. A. H. Smith, et al., *JMS* **262** (2010) 122-134.

[b] D. C. Benner, C. P. Rinsland, V. Malathy Devi, M. A. H. Smith and D. A. Atkins, *JQSRT* **53** (1995) 705-721.

[c] V. Malathy Devi, D. C. Benner, L. R. Brown, C. E. Miller and R. A. Toth, *JMS* **242** (2007) 90-117.

[d] V. Malathy Devi, D. C. Benner, M. A. H. Smith, et al., *JQSRT* (2012) in press.

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