SELF-BROADENING AND SELF-SHIFT COEFFICIENTS IN THE 1-0 BAND OF $^{12}C^{16}O$

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High quality and precise pressure broadening and pressure-induced shift coefficients of self-broadened CO covering the P(31) to R(31) transitions in the spectral region between 2008 and 2248 cm^{-1} of the fundamental band have been determined from spectra recoreded with the high-resolution (0.0027 cm^{-1}) McMath-Pierce Fourier transform spectrometer of the National Solar Observatory at Kitt Peak. The measurements were made at room temperature using a natural carbon monoxide sample contained in Pyrex absorption cells 4.08 and 9.98 cm long. Various pressures of CO were used, ranging between 0.2 Torr and 205 Torr. The results were obtained by analyzing 5 spectra simultaneously using our multispectrum nonlinear least-squares technique.[a] The broadening coefficients of lines with same values of m in the P and the R branches agreed within experimental errors while the shift coefficients showed considerable structure within and between the two branches. Except for a small positive shift for the R(13) line, all measured shift coefficients were negative. The mean pressure-shift coefficient is -1.95(92)x10^{-3} cm^{-1} atm^{-1} at 296 K, the value given in parentheses being the scatter among the shift coefficients of the various rotational quantum numbers. Comparisons with other published data were made.

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