

LINE BROADENING, THE TEMPERATURE EXPONENT AND LINE MIXING IN THE FUNDAMENTAL BAND OF CO-N₂ MIXTURES

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We have measured the width of many P and R lines of the fundamental vibration-rotation band of CO perturbed by N₂ at 348 K and pressures of about 50 kPa. We have also extended the measurements made earlier at 301 K. The broadening coefficients were obtained with an accuracy of 0.3 % or better by fitting with a Lorentzian, a Voigt and an empirical lineshape model that blends together a hard collision model and a speed dependent Lorentzian profile. In all cases the results are represented by an empirical exponential power law polynomial in the line number, m . Combining the data at the two temperatures yields the exponent n for the temperature dependence as a function of line number. The broadening coefficients and the variation of the temperature exponent with the line number are compared with theory. In addition, the line mixing parameters were also measured and compared with values deduced from the broadening coefficients using an exponential power gap law.