

Direct measurements and theoretical calculations of CO-He line-shape parameters and their temperature dependences in the fundamental band of CO

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In this presentation we report on direct measurements and theoretical calculations for He-broadened Lorentz half-width, pressure-shift, and line mixing coefficients of 45 carbon monoxide transitions in the $1\leftarrow 0$ band. The spectra analyzed in this study were recorded over a range of temperatures between 296 and 80 K. The He-broadened line parameters and their temperature dependences were retrieved using a multispectrum nonlinear least squares program. A previous analysis of these spectra used only the Voigt line shape. The line shape models used here include Voigt, speed dependent Voigt, Rautian (to take into account confinement narrowing) and Rautian with speed dependence. We were unable to retrieve the temperature dependence of line mixing coefficients. The line mixing coefficients were also derived from the Exponential Power Gap law and the energy corrected sudden approximation. The current measurements and theoretical results are compared with other published results, where appropriate.

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References

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