LINE WIDTHS AND SHIFTS IN THE $1 \leftarrow 0$ BAND OF $^{12}C^{16}O$ BROADENED BY HELIUM AT TEMPERATURES BETWEEN ∼80 AND 297 K

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Carbon monoxide is present in the atmospheres of most of the planets in our solar system, including Jupiter and Saturn, where the predominant broadening gases are hydrogen and helium. Previous studies of the temperature-dependence of helium-broadened CO infrared line widths have been limited to small numbers of lines[abc]. In the present study we have determined Lorentz pressure-broadening and pressure-induced shift coefficients along with their temperature dependences for over 40 P- and R-branch transitions in the fundamental band of $^{12}C^{16}O$ broadened with helium. A total of 19 spectra recorded at various temperatures (+24 to −194 °C) in the 2010 to 2260 cm^{-1} spectral region were analyzed simultaneously using a multispectrum nonlinear least squares technique[d]. The spectra were recorded with the McMath-Pierce Fourier transform spectrometer located at the National Solar Observatory on Kitt Peak. We have compared the present results with similar measurements reported recently.

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