AIR-BROADENED LINE SHAPES IN THE 2ν3 R BRANCH OF 12CH4 BETWEEN 6014 AND 6100 CM−1


Complete and accurate information on line shape parameters of 2ν3 methane transitions for air broadening as a function of temperature is critical not only for the correct interpretation of the observed atmospheric spectra but also for the development of a reliable theoretical model. For this reason, we obtained a series of high-resolution, high S/N spectra of high-purity 12CH4 and 12CH3 broadened with dry air at temperatures in the 130 to 295 K range using the Bruker IFS 125HR Fourier transform spectrometer at JPL. Two absorption cells were used in the experiment, a White cell with path length of 13 m for room temperature spectra and a 21 m Herriott cella for cold sample spectra. The 15 spectra used in the analysis consisted of 3 low pressure (0.26 to 2.57 Torr) spectra with pure 12CH4 and 12 air-broadened spectra with total sample pressures of 79-805 Torr and volume mixing ratios of methane between 0.23 and 1%. A multispectrum least-squares fitting techniqueb was employed to fit all 15 spectra simultaneously. Preliminary results for select R(J) manifolds will be presented.c

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