LINE MIXING COEFFICIENTS IN THE ν_3 BAND OF $^{12}CH_4$ AND $^{13}CH_4$

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Over 40 high-resolution absorption spectra of methane as previously described[a b] were recorded. Included in the spectra recorded at Kitt Peak were room temperature spectra of methane highly enriched in $^{13}CH_4$ broadened by air and having a 5 cm path length. All of these spectra were simultaneously fitted[c] in order to obtain spectral line parameters in the ν_3 spectral region of $^{12}CH_4$ and $^{13}CH_4$. In order to obtain reasonable fits, it was necessary to include line mixing[d] within the rotational manifolds. Line mixing was only required between spectral lines of the same species of methane. All of the P branch has been measured and measurement of the R branch is in progress. Mixing coefficients for the two isotopes and the two branches will be compared. It was also possible in a few cases to measure the line mixing coefficients between pairs of spectral lines belonging to the ν_2+ν_4 band.

[a] V. Malathy Devi, D. Chris Benner, M. A. H. Smith, C. P. Rinsland, G. Guelachvili and L. R. Brown, Self- and Air-Broadening and Shift Coefficients of CH_4 lines in the 3 μm Region, this conference (1998).

[b] V. Malathy Devi, D. Chris Benner, Mary Ann H. Smith, Curtis P. Rinsland, Guy Guelachvili and Linda R. Brown, Temperature Dependence Of Air-Broadening and Shift Coefficients in the ν_3 Band of $^{12}CH_4$, this conference (1998).

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

[d] D. C. Benner, A Multispectrum Nonlinear Least Squares Fitting Technique: Inclusion of Line Mixing, this conference (1998).