NITROGEN-BROADENED $^{13}$CH$_4$ AT 80 TO 296 K


High-resolution spectra of the $\nu_4$ fundamental band of $^{13}$CH$_4$ broadened by N$_2$ at temperatures relevant to the atmosphere of Titan were recorded using temperature-controlled absorption cells$^a$ installed in the sample compartment of a Bruker IFS-125HR Fourier Transform spectrometer (FTS) at the Jet Propulsion Laboratory (JPL). Analysis of these spectra using multispectrum fitting$^b$ has determined half widths, pressure-induced shifts, line mixing parameters and their temperature dependences for transitions belonging to a number of P- and R-branch J-manifolds. The analysis examined in detail the temperature-dependence of N$_2$-broadened half width and pressure-induced shift coefficients over the entire temperature range from 80 K to 296 K. The results are compared with other published measurements of N$_2$- and air-broadened methane parameters.$^c$

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