INTENSITIES, SELF- AND AIR-BROADENING, AND PRESSURE-INDUCED LINE SHIFTS IN THE $2\nu_2$ BAND OF HCN

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High-resolution infrared absorption spectra of HCN in the $2\nu_2$ band region near 1411 cm^{-1} have been recorded with the Bruker IFS 120 HR Fourier transform spectrometer located at Pacific Northwest National Laboratory. The measurements were all made at ambient temperatures between 24.7 and 24.9°C, although the variation during the course of recording each spectrum was less than ± 0.01°C. Two stainless steel absorption cells that were electroplated and gold coated to minimize reactivity were used to obtain the spectra; their path lengths were 0.958 and 19.95 cm. Four spectra of high-purity (99.8%) HCN together with three spectra of lean mixtures ($\sim 3\%$) of HCN in dry air were simultaneously fit using a multispectrum nonlinear least squares procedure.[a] The analysis yielded room-temperature values for absolute intensities, self- and air-broadening coefficients and self- and air-induced pressure shift coefficients for numerous lines in the $2\nu_2$ band of $H^{12}C^{14}N$. Since there are no previous measurements of broadening and shift parameters in the $2\nu_2$ band, our results will be compared with values recently determined in the ν_1 band of $H^{12}C^{14}N$[b] and with current HITRAN values.[c]

[a] D. Chris Benner, C. P. Rinsland, V. Malathy Devi, M. A. H. Smith and D. Atkins, *JQSRT* **53**, 705-721 (1995).
[b] C. P. Rinsland et al., *JQSRT*, in press (2003).
[c] L. S. Rothman et al., *JQSRT*, in press (2003).