ABSOLUTE INTENSITIES OF O_3 LINES IN THE 9-11 μm REGION

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We have extended our previous analysis of high-resolution absorption spectra of ozone[a] to determine absolute intensities of nearly 200 $^{16}O_3$ lines in the 9-11 μm region. The spectra were recorded at room temperature using the Fourier transform spectrometer at the McMath-Pierce facility of the National Solar Observatory at Kitt Peak, covering the 800-1400 cm^{-1} region at 0.0027 cm^{-1} resolution. The ozone samples were contained in a glass cell having crossed IR-transmitting and UV-transmitting paths approximately 10 cm in each direction. A 254 nm UV-absorption monitor of the same design as Pickett et al.[b] was used to measure the ozone partial pressures, which were kept at approximately 0.3 to 0.5 Torr to prevent the appearance of saturated lines. Only spectra for which the ozone partial pressure varied by < 1.0 % during the recording time were selected for analysis. Using our multispectrum nonlinear least-squares procedure,[c] we have fit four spectra simultaneously to determine intensities for numerous lines in both the P and R branches of the ν_3 fundamental band and several lines in the ν_1 band. On average, our measured intensities are only 1 % larger than the values on the current HITRAN compilation.[d] Our measurement set includes 44 ν_3 lines in common with other recent experimental studies.[bef] Comparison of these various measurements shows excellent agreement for a few lines and adequate agreement (considering all possible sources of uncertainty and systematic errors) for the others.

[a]M. A. H. Smith, C. P. Rinsland, V. Malathy Devi, and D. Chris Benner, 51st International Symposium on Molecular Spectroscopy, Paper MH14 (1996).

[b]H. M. Pickett, D. B. Peterson, and J. S. Margolis, *J. Geophys. Res.* **97**, 20,787-20,793 (1992).

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

[d]L. S. Rothman, R. R. Gamache, R. H. Tipping, C. P. Rinsland, M. A. H. Smith, D. C. Benner, V. Malathy Devi, J.-M. Flaud, C. Camy-Peyret, A. Perrin, A. Goldman, S. T. Massie, L. R. Brown, and R. A. Toth, *JQSRT* **48**, 469-507 (1992); L. S. Rothman *et al.*, in preparation, (1997).

[e]M. R. DeBacker and D. Courtois, 50th International Symposium on Molecular Spectroscopy, Paper RA06 (1995).

[f]M. R. DeBacker, B. Parvitte, V. Zeninari, and D. Courtois, *JQSRT* **54**, 1009-1018 (1995).