

ABSOLUTE INTENSITIES OF O₃ LINES IN THE 9-11 μm REGION

M. A. H. SMITH, C. P. RINSLAND, *Atmospheric Sciences Division, NASA Langley Research Center, Mail Stop 401A, Hampton, VA 23681-2199*; V. MALATHY DEVI, and D. CHRIS BENNER, *Department of Physics, The College of William and Mary, Box 8795, Williamsburg, VA 23187-8795*.

We have completed our analysis of high-resolution (0.0027 cm^{-1}) absorption spectra of ozone^a to determine absolute intensities of 376 ¹⁶O₃ 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. The ozone samples were contained in a glass cell having crossed IR-transmitting and UV-transmitting paths approximately 10 cm in each direction. The ozone partial pressures (0.3 to 0.5 Torr) in the cell were determined from measurements of the 254 nm UV-absorption, using the absorption cross-section of Mauersberger et al.^b as a reference standard. Only spectra for which the ozone partial pressure varied by < 1.0 % during the recording time were selected for analysis. A multispectrum nonlinear least-squares procedure^c was used to fit four spectra simultaneously to determine intensities for 366 lines in the *P*, *Q*, and *R* branches of the ν_3 fundamental band and 10 lines in the *R* branch of the ν_1 band. The absolute accuracy of these intensity values ranges from 2 % for the strongest, most well-determined lines to 4 or 5 % for the weakest lines measured. On average, our measured intensities are approximately 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.^{e f g} 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.

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