EXPERIMENTAL LINE PARAMETERS OF THE OXYGEN A-BAND AT 0.762 μm

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SAGE III (an EOS remote sensing experiment scheduled to orbit the Earth) will utilize the prominent features of the oxygen A-band to monitor atmospheric pressure and temperature. To support this, a laboratory study has been undertaken to measure intensities, pressure-broadened line widths and pressure-induced frequency shifts for the strongest transitions between 13040 and 13165 cm^{-1}. Experimental values have been obtained from over thirty spectra recorded at 0.02 cm^{-1} resolution with the McMath Fourier transform spectrometer located at Kitt Peak National Observatory / National Solar Observatory in Arizona. These data have been taken with gas samples of pure oxygen and oxygen / nitrogen mixtures at room and cold temperatures (down to 200 K) in order that the temperature dependences of the self- and nitrogen-broadened widths can be determined. Finally, for calibration, a broad band spectrum has been recorded between 4000 and 14000 cm^{-1} using InSb and Silicon diode detectors simultaneously; with this, the line positions of the A-band of oxygen have been referenced to CO standards [a] in the 2-0 and 3-0 bands (at 2.35 and 1.57 μm respectively). [b]

[a] C. R. Pollock, F. R. Petersen, D. A. Jennings, J. S. Wells and A. G. Maki, J. Mol. Spectrosc. v30, 37-44 (1983) and N. Picque and G. Guelachvili, J. Mol. Spectrosc. v185, 244-248 (1997).

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