A COMPLETE SET OF LINE PARAMETERS FOR CH_3Br IN THE 10-μm SPECTRAL REGION

D. JACQUEMART, N. LACOME, *Université Pierre-et-Marie-Curie-Paris 6, Laboratoire de Dynamique, Interactions et Réactivité, CNRS, UMR 7075, Case courrier 49, Bât F 74, 4, place Jussieu, 75252 Paris Cedex 05, France*; F. KWABIA-TCHANA, *Laboratoire de Physique des Lasers, UMR 7538 CNRS, Université Paris 13, 99 Avenue Jean Baptiste Clément, 93430 Villetaneuse, France*; I. KLEINER, *Université Paris 12 et Paris 7, Laboratoire Inter-Universitaire des Systèmes Atmosphériques, CNRS, UMR 7583, 61 avenue du Général de Gaulle, 94010 Créteil Cedex, France*.

Methyl bromine is of interest for atmospheric applications, since this molecule is directly involved in the catalytic destruction of ozone in the lower stratosphere. At the present time no spectroscopic data is available in the atmospheric databases as HITRAN or GEISA. Using FT spectra (Bruker IFS 120, unapodized FWHM resolution of 0.001 cm^{-1}) of methyl bromide CH_3Br, absolute line positions and intensities, as well as self-and N_2-broadening coefficients have been measured for about 1200 lines between 880 and 1050 cm^{-1} in the ν_6 band of $^{12}CH_3{}^{79}Br$ and $^{12}CH_3{}^{81}Br$. These measurements improve the accuracy on wavenumbers and line intensities previously obtained and lead to a complete set of self- and N_2-broadening coefficients for which clear J-and K-dependences have been observed for the first time. A multispectrum fitting procedure has been used to retrieve simultaneously the line parameters from 6 experimental spectra recorded at different pressures of CH_3Br and N_2. A wavenumber calibration has been performed using the frequencies of the ν_2 band of NH_3. Average absolute accuracies of the measurements have been estimated around 0.0005 cm^{-1} for line positions, 5% for line intensities, and 5-10% for broadening coefficients. A theoretical treatment of wavenumbers permitted the prediction of assignments and wavenumbers for the whole 10-μm spectral region. Line intensities have been analyzed to deduce the effective vibrational transition moment squared as well as Herman-Wallis coefficients. Self-and N_2- broadening coefficients have been reduced using an empirical polynomial expansion function of J and K. Then, a complete line list containing line positions, intensities, self- and N_2-broadening coefficients has been generated for atmospheric purposes with all lines from 820 to 1120 cm^{-1} having intensities greater than 10^{-5} $cm^{-2}.atm^{-1}$.