THE ν_2 BANDS OF $BrNO_2$ (NITRYL BROMIDE) AROUND 787 CM^{-1}

F. K. TCHANA, J. ORPHAL, I. KLEINER, *CNRS, Laboratoire de Photophysique Moléculaire, 91405 Orsay Cedex, France*; B. REDLICH, *Institut für Anorganische Chemie, Universität Münster, 48149 Münster, Germany*; D. SCHEFFLER, H. WILLNER, *Institut für Anorganische Chemie, Universität Duisburg, 47048 Duisburg, Germany*; R. MBIAKE, *Centre de Physique Atomique Moléculaire et Optique Quantique, Université de Douala, Cameroun*; O. BOUBA, *Université de Ngaoundéré, Cameroun*.

Nitryl bromide, $BrNO_2$, is produced in the marine troposphere by heterogeneous reactions between nitrogen oxides and bromine containing aerosols.[a] Its peak concentrations reach values of several 10^7 cm^{-3}.[b] In polluted coastal areas, therefore, $BrNO_2$ is an important species in the release of bromine from the ocean into the atmosphere.[c]
The ν_2 fundamental bands of $^{79}BrNO_2$ and $^{81}BrNO_2$, located around 787 cm^{-1} (12.7 μm), were recorded using a high-resolution Fourier-transform infrared spectrometer. A total of nearly 5000 transitions with $J \leq 80$ and $K_a \leq 30$ were reproduced using a Watson-type A-reduced Hamiltonian with a root-mean-square deviation of better than 5×10^{-4}cm^{-1}. Rotational and centrifugal distortion constants for the v_2 states have been determined, as well as an improved set of ground state constants for both isotopomers. Due to their sharp Q branches falling into an atmospheric window, the ν_2 bands might be useful for future attempts to detect atmospheric $BrNO_2$.

[a] W. Behnke, V. Sheer, and C. Zetzsch, J. Aerosol. Sci. 25, S277-S278, 1994.
[b] J. Moldanova and E. Ljungström, J. Geophys. Res. D106, 1271-1296, 2001.
[c] R. Vogt, P. J. Crutzen, and R. Sander, Nature 383, 327-330, 1996.