ABSOLUTE LINE INTENSITIES IN THE 2 μm REGION OF $^{14}N_2{}^{16}O$ AND THEIR TREATMENT USING THE EFFECTIVE DIPOLE MOMENT APPROACH

L. DAUMONT, J-L. TEFFO, *Laboratoire de Physique Moléculaire et Applications, CNRS, Boîte 76, Université Pierre et Marie Curie, 4 Place Jussieu, F-75252 Paris-Cedex 05, France*; J. VANDER AUWERA, *Laboratoire de Chimie Physique Moléculaire C. P. 160/09, Université Libre de Bruxelles, 50 avenue F. D. Roosevelt, B-1050 Brussels, Belgium*; V. I. PEREVALOV and S. A. TASHKUN, *Institute of Atmospheric Optics, Russian Academy of Sciences, Siberian Branch, 1 Akademicheskii avenue, 634055 Tomsk, Russia*.

This work continues a series of publications devoted to the application of the effective operators approach to the vibrational-rotational treatment of linear triatomic molecules, aiming at the analysis and prediction of infrared spectra of such molecules.[a] In that frame, the present work aims at describing line intensities of cold and hot bands of $^{14}N_2{}^{16}O$ in its ground electronic state in the spectral range above 3600 cm^{-1}. Because of the very large spectral range and number of data, the treatment is first done on a polyad-by-polyad basis. The absorption spectra of N_2O, at room temperature, have been recorded at a resolution of 0.007 cm^{-1} in the range from 4300 to 5200 cm^{-1} using a Bruker IFS120HR Fourier transform spectrometer. Sample pressure / absorption path length products ranging from 7 to 540 mbar have been used. More than 1000 absolute line intensities have been measured in 21 bands belonging to the $\Delta P = 2\Delta v_1 + \Delta v_2 + 4\Delta v_3 = 8$ series. Using wavefunctions previously determined from a global fit of an effective hamiltonian to about 18000 line positions, parameters of a corresponding effective dipole moment have been fitted to the experimental intensities of cold and hot bands. Results will be presented and discussed.

[a] J-L. Teffo, V. I. Perevalov and O. M. Lyulin, J. Mol. Spectrosc. 168, 390 (1994); J-L. Teffo, O. M. Lyulin, V. I. Perevalov and E. I. Lobodenko, J. Mol. Spectrosc. 187, 28 (1998) and references therein.