LINE INTENSITIES MEASUREMENTS IN $^{13}C^{16}O_2$ AND THEIR TREATMENT USING THE EFFECTIVE OPERATORS APPROACH

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This work deals with the modeling of line intensities of cold and hot bands of $^{13}C^{16}O_2$ corresponding to $\Delta P = 5$ transitions ($P = 2V_1 + V_2 + 3V_3$), using the effective operators approach.[a] In Brussels, 5 unapodized absorption spectra of $^{13}C^{16}O_2$ (98% purity, $P \times \ell = 7.43 - 538$ mbar×m, room temperature) were recorded at a resolution of 0.0035 cm^{-1} (MOPD $= 257.1$ cm) using a Bruker IFS120HR. 382 absolute line intensities were measured in 9 bands observed between 3090 and 3920 cm^{-1}. In Paris, 2 apodized absorption spectra of an ^{18}O–enriched CO_2 sample (297.0 K, $\ell = 8.07(2)$ and 36.07(4) m, P = 1.685(8) torr) containing 0.5% of $^{13}C^{16}O_2$ were recorded at a resolution of 0.0043 cm^{-1} using a home–made FTS. 90 absolute line intensities were measured for 5 bands observed from 3400 to 3700 cm^{-1}. A least squares fit of 479 observed line intensities, including those measured in this work and published for the 21102-00001 band,[b] allowed determination of 12 effective dipole moment parameters corresponding to the $\Delta P = 5$ series of transitions (weighted standard deviation χ = 0.855, RMS deviation = 4.69%). The new set of effective dipole moment parameters will soon be used to update the *Carbon Dioxide Spectroscopic Databank* (CDSD–1000).[c] Results will be presented and discussed.

[a] S.A. Tashkun, V.I. Perevalov, J.-L. Teffo, L.S. Rothman, and Vl.G. Tyuterev, J. Quant. Spectrosc. Radiat. Transfer 60, 785–801 (1998); J.-L. Teffo, O.M. Lyulin, V.I. Perevalov, and E.I. Lobodenko, J. Mol. Spectrosc. 187, 28–41 (1998).

[b] Y. Ding, P. Macko, D. Romanini, V.I. Perevalov, S.A. Tashkun, J.-L. Teffo, S. Hu, and A. Campargue, J. Mol. Spectrosc. 226, 146–160 (2004).

[c] S.A. Tashkun, V.I. Perevalov, J-L. Teffo, A.D. Bykov, and N.N. Lavrentieva, J. Quant. Spectrosc. Radiat. Transfer 82, 165–196 (2003); http://cdsd.iao.ru, http://cdsd.lpma.jussieu.fr, ftp://ftp.iao.ru/pub/CDSD-1000.