LINE SHIFT AND LINE BROADENING IN FUNDAMENTAL BANDS OF DIFFERENT ISOTOPOMERES OF CARBON MONOXIDE

S. VOIGT, J. P. BURROWS, J. ORPHAL, *Institute of Environmental Physics, University of Bremen, P. O. Box 330440, 28334 Bremen, Germany*; A. KISSEL, H.-D. KRONFELDT, O. KURTZ, I. MEUSEL, and B. SUMPF, *Institute of Optics, Technical University Berlin, Sekr. PN 0-1, Hardenbergstr. 36, 10623 Berlin, Germany*.

In this paper we present results concerning line shift and line broadening in the fundamental band of different isotopomeres of carbon monoxide near 2058 cm^{-1}. The study includes lines of $^{12}C^{16}O$ and for the first time lines of $^{13}C^{16}O$, $^{12}C^{18}O$, $^{13}C^{18}O$, and $^{13}C^{17}O$ perturbed by N_2, O_2, H_2, D_2, He, Ne, Ar, Kr, and Xe. The results for Kr, H_2, and D_2 represent the first experimental data for the (1←0) band of CO. For all perturbers except helium all line-shift coefficients are negative. Within the experimental uncertainties the data show no significant dependence on the isotopomere. As known for $^{12}C^{16}O$ for collisions with noble gases the absolute value of the line-shift coefficients increase with increasing mass of the perturber. Lines from R-branches show smaller shift coefficients compared to P-branch lines. Our absolute values for the line-shift coefficients for the (1←0) band confirm the trend that the effect for this band is smaller compared to the (2←0) band as known from former experimental data by Bouanich *et al.*[a]. The nitrogen broadening will be compared to previous measurements for $^{13}C^{16}O$ by Voigt *et al.*[b].

[a] J.-P. Bouanich, D. Bermejo, J. L. Domenech, R. Z. Martinez, *J. Mol. Spectrosc.* **179**, 22 (1996)
[b] S. Voigt, S. Dreher, J. Orphal, J. P. Burrows, *J. Mol. Spectrosc.* **180**, 359 (1996)