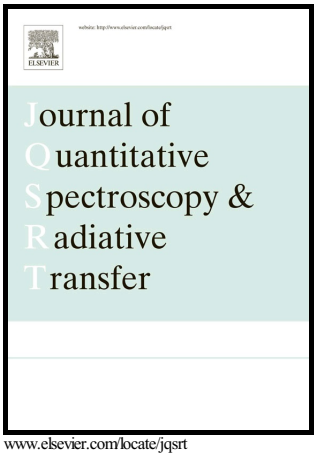

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Room Temperature Self- and H_2-Broadened Line Parameters of Carbon Monoxide in the First Overtone Band: Theoretical and Revised Experimental Results

Koorosh Esteki[1,2], Adriana Predoi-Cross[1*], Chad Povey[1], Sergey Ivanov[3], Aziz Ghoufi[4], Franck Thibault[4], Mary Ann H. Smith[5]

[1] Department of Physics and Astronomy, University of Lethbridge, Lethbridge, AB, Canada

[2] Present address: Mechanical and Manufacturing Engineering, Schulich School of Engineering, University of Calgary, Calgary, AB, Canada

[3] Federal Scientific Research Centre "Crystallography and Photonics" of Russian Academy of Sciences (FSRC "Crystallography and Photonics" RAS), Leninsky pr. 59, Moscow, 119333, Russia

[4] Institut de Physique de Rennes, UMR CNRS 6251, Université de Rennes 1, Campus de Beaulieu, F-35042 Rennes, France

[5] Science Directorate, NASA Langley Research Center, Hampton, VA, USA

[*]Corresponding author. Department of Physics and Astronomy, University of Lethbridge, Lethbridge, AB, T1K 3M4 Canada, Tel: 403-329-2697 Fax: 403-329-2057, E-mail: adriana.predoicross@uleth.ca

Abstract

Lorentz self- and H_2-broadened half-width and pressure-induced shift coefficients, line mixing coefficients as well as line center positions and intensities were obtained using a nonlinear least square fitting technique for 48 (P(24) to R(23)) ro-vibrational transitions belonging to the first overtone (2←0) band of $^{12}C^{16}O$ at room temperature. All spectra in the 4146 to 4332 cm^{-1} spectral interval were fitted simultaneously employing four line shape functions: the Voigt, Speed Dependent Voigt, Rautian and Speed Dependent Rautian profiles. The collisional line mixing effect has been observed and investigated as an asymmetry in the analyzed line profiles. A semi-empirical Exponential Power Gap Law method was used to estimate the self- and H_2-broadening coefficients and the collisional line mixing parameters. Additionally, a classical approach was applied to calculate the half-width coefficients of