

EXPERIMENTAL AND THEORETICAL He-BROADENED LINE PARAMETERS OF CARBON MONOXIDE IN THE FUNDAMENTAL BAND

ADRIANA PREDOI-CROSS, HOIMONTI ROSARIO, KOOROSH ESTEKI, SHAMRIA LATIF, HOSSEIN NASERI, *Department of Physics and Astronomy, University of Lethbridge, Lethbridge, Canada*; FRANCK THIBAUT, *Institut de Physique de Rennes, Université de Rennes 1, Rennes, France*; V. MALATHY DEVI, *Department of Physics, College of William and Mary, Williamsburg, VA, USA*; MARY ANN H. SMITH, *Science Directorate, NASA Langley Research Center, Hampton, VA, USA*; ARLAN MANTZ, *Department of Physics, Astronomy and Geophysics, Connecticut College, New London, CT, USA*.

We report experimental measurements and theoretical calculations for He-broadened Lorentz half-width coefficients and He- pressure-shift coefficients of 45 carbon monoxide transitions in the 1-0 band. The high-resolution spectra analyzed in this study were recorded over a range of sample temperatures between 296 and 80 K. The He-broadened line parameters and their temperature dependences were retrieved using a multispectrum nonlinear least squares analysis program. A previous analysis of these spectra^a used only the Voigt line shape. In the present study four line shape models were compared including Voigt, speed dependent Voigt, Rautian (to take into account confinement narrowing) and Rautian with speed dependence. The line mixing coefficients have been calculated using the Exponential Power Gap scaling law. We were unable to retrieve the temperature dependence of the line mixing coefficients. The current measurements and theoretical results are compared with other published results, where appropriate.

^aA. W. Mantz *et al.*, *J. Molec. Structure* **742** (2005) 99-110.