CHARACTERIZATION OF LINE BROADENING AND SHIFT PARAMETERS OF OZONE FOR SPECTROSCOPIC DATABASES

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Prior to 1997, most reported measurements of ozone line broadening and shift parameters involved the stronger transitions with $0 \leq K_a'' \leq 4$. The broadening coefficients for this narrow range of K_a'' could be empirically modeled within the uncertainty of the measurements by polynomials in J''[a,b]. This allowed the prediction of broadening coefficients for transitions that had not been measured in the laboratory or calculated with detailed molecular interaction models. However, more extensive measurements involving higher K_a'' transitions in the ν_1 and ν_2 bands[c,d] show that polynomials in J'' do not adequately reproduce the measured broadening coefficients for the entire range of observed K_a''. This paper reports a set of polynomials in J'' and K_a'', each valid for a specific range of K_a'' values, that reproduce most published measured air- and self-broadening coefficients of O_3 within their experimental uncertainties. Dependence of air-induced line shift coefficients on the vibrational and rotational quantum numbers will also be examined.

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