NEGATIVE ANISOTROPIC OVERLAP CONTRIBUTION TO THE COLLISION-INDUCED-ABSORPTION 2-0 BAND OF H_2 IN THE PURE GAS AT 77, 201, AND 295 K .

C. STAMP, P. G. GILLARD, E. van NOSTRAND and SATTI PADDI REDDY, *Department of Physics, Memorial University of Newfoundland, St. John's, NL, A1B 3X7, Canada*.

Collision-induced absorption spectra of H_2 in the pure gas in its first overtone region was recorded with a 2 m cell for gas densities up to 435 amagat at 77, 201 and 295 K. The spectra consist of pure overtone (Δv = 2) transitions; $O_2(J) + Q_0(J)$, $Q_2(J) + Q_0(J)$, $S_2(J) + Q_0(J)$ and $Q_2(J) + S_0(J)$, and fundamental (Δ v=1) transitions $O_1(J) + Q_1(J)$, $Q_1(J) + Q_1(J)$ and $S_1(J) + Q_1(J)$, J varying from 0 to 3.[a] . Birnbaum-Cohen (BC) lineshape function[b] was used in the profile analysis of the observed spectra. It is found that the isotropic overlap contribution to the first overtone band is negligible and the anisotropic overlap contribution to the absorption of pure overtone transitions is negative. The latter was estimated by effectively scaling down the values of the quadrupolar matrix elements of the pure overtone transitions. Details of the results of the profile analysis, parameters of the BC lineshape function and binary and ternary absorption coefficients will be presented.

[a] S. P. Reddy in *Phenomena Induced by Intermolecular Interactions*, ed. G. Birnbaum , Plenum Press 1985.
[b] G. Birnbaum and E. R. Cohen, *Can. J. Phys.*, 54, 593 (1976).