INDUCED INFRARED SPECTRA OF DOUBLE VIBRATIONAL TRANSITIONS IN $H_2 - N_2$ AND $D_2 - N_2$

C. STAMP, R. D. G. PRASAD, P. G. GILLARD, and S. PADDI REDDY, *Department of Physics and Physical Oceanography, Memorial University of Newfoundland, St. John's, NF, A1B 3X7, Canada*.

Collision-induced infrared absorption spectra of the double vibrational transitions of H_2 (v=1 $\leftarrow$ 0) + D_2 (v=1 $\leftarrow$ 0) have been investigated in their binary mixtures in the spectral region 5900 - 7100 cm^{-1}. The spectra were recorded with a 2 m absorption cell for partial densities of H_2 and N_2 in the range 60 to 315 and 100 to 315 amagat. respectively, at room temperature. The observed spectra are interpreted in terms of the following transitions: $O_1(J)$ of $H_2 + Q_1(J)$ of N_2; $Q_1(J)$ of $H_2 + O_1(J)$ of N_2; $Q_1(J)$ of $H_2 + Q_1(J)$ of N_2; $Q_1(J)$ of $H_2 + S_1(J)$ of N_2; $S_1(J)$ of $H_2 + Q_1(J)$ of N_2.

Analysis of the absorption profiles has been carried out. Similar experiments with binary mixtures of $D_2 + N_2$ are also in progress. The results of this work including the absorption coefficients, line-shape function, etc., will be presented.