COMPARISON OF LOW TEMPERATURE PRESSURE BROADENING OF NH_3 BY HE, NORMAL- H_2 AND PARA- H_2

D. R. WILLEY, R. E. TIMLIN, JR., J. M. MERLIN, M. M. SOWA and D. M. WESOLEK, *Department of Physics, Allegheny College, Meadville, PA 16335*.

We have completed low temperature pressure broadening studies of NH_3 inversions transitions for broadening by He and molecular hydrogen. Pressure broadening of the (J, K) = (1, 1), (2, 2) and (3, 3) inversion transitions of NH_3 by He, normal- H_2 and para- H_2 has been observed from 10 to 40 K. We find that the He cross sections are the smallest followed by the para- H_2 cross sections which are two to five times larger with the normal- H_2 cross sections being two to ten times larger than for He. In addition, we have used *ab initio* potential surfaces to calculate He and para- H_2 cross sections for comparison with our experimental data.