

in both types of NH_4Br samples. Thus impurities and crystal defect are not a problem in the present investigation.

The high pressure cell used in this work is a modified version of the optical cell originally designed by Drickamer.³² The cell was calibrated at room temperature with well established phase transitions and the linear variation of C-N stretch frequency. The cell is most reliable at 5 to 30 kbar region with the pressure accuracy being approximately ± 2 kbar. Each rectangular sample (2x2x3 mm) of ammonium halide was placed in the high pressure cell with the [100] direction perpendicular to the incident light. Wavenumber measurements were always initiated at low pressures and gradually the pressure was increased to 40 kbar over a period of several days. The system was allowed to equilibrate at each pressure for a half to several hours. The equilibration time appeared to have no marked effect on the wavenumbers, but peak intensities appear to increase with time at pressures lower than 10 kbar. Usually the solid-solid transition line was approached from lower pressure. However, the data were checked on recrossing the boundary from high pressures.

RESULTS

Atmospheric Pressure Spectra.

The high wavenumber polarization spectra ($1000\text{--}3400\text{ cm}^{-1}$) of NH_4Cl and NH_4Br were carefully studied at atmospheric pressure and 296 K to determine accurate values of the wavenumbers. The upper two spectra in Fig. 2 are typical polarization spectra for "disordered" NH_4Cl in two scattering geometry, while the corresponding spectra of "disordered" NH_4Br are given in the lower two traces (Fig. 2). The Raman spectra of these two halides are quite similar