

CAPTIONS

Fig. 1. Generalized phase diagram for NH_4Cl , NH_4Br and NH_4I . In this representation, three separate phase diagrams have been placed side by side. Each phase diagram starts on the left side at atmospheric pressure. The high temperature phase I has NaCl-like structure, while the remaining phases consist of CsCl-like arrangement of nitrogen and halogen atoms. The "disordered" phase of NH_4Cl "II" was relabeled as $\text{NH}_4\text{Cl V}$ in reference 7 for reasons cited herein. At 1 atm and 300 K, both $\text{NH}_4\text{Cl V}$ and $\text{NH}_4\text{Br II}$ are "disordered" whereas both halides have ordered structure with parallel arrangement of the NH_4^+ ion (T_d^1) in phase IV. $\text{NH}_4\text{Cl V}$ transforms into the higher temperature phase II at approximately 75°C at 1 atm.¹⁰ The relative position for II-V phase boundary in NH_4Cl is indicated by the dotted line (...). $\text{NH}_4\text{Br III}$ has a tetragonal structure with D_{4h}^7 space group. The present work reports changes accompanying isothermal compression in NH_4Cl (phase V and IV) and NH_4Br (phase II and V) at 296 K.

Fig. 2. High frequency polarization spectra for "disordered" $\text{NH}_4\text{Cl V}$ (upper two figures) and $\text{NH}_4\text{Br II}$ (lower two figures) are shown in two scattering geometries. The direction of incident and scattered light are given outside the parentheses while the corresponding polarization are placed inside. The asterisks indicate the spillover from peaks active in other scattering geometry.

Fig. 3. Shift of the internal mode frequencies (cm^{-1}) of the NH_4^+ ion in NH_4Br and NH_4Cl with increasing pressure at 296 K.