

Abstract Submitted
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X-Ray Raman scattering of Aluminum Nitride under high pressure¹ NEELANJAN BHATTACHARYA, MICHAEL PRAVICA , Dept of Physics and Astronomy, University of Nevada Las Vegas and High Pressure Science and Engineering Center, Las Vegas, NV 89154-4002 — We performed a high pressure study of aluminum nitride using x-ray Raman spectroscopy (XRS) up to 33 GPa in a diamond anvil cell at ambient temperature. We utilized the 16 ID-D undulator beamline at the Advanced Photon Source for the x-ray source. The spectrometer was set up to measure photons with about 410 eV energy loss (nitrogen edge) with respect to the elastic scattering energy (at 9.986 keV). The diamond cell was oriented relative to the x-ray beam so that the incident x-rays passed through a sample-confining beryllium gasket pressed between two diamonds. The inelastically scattered x-rays were collected by a fixed set of silicon mirrors. The Wurzite to rocksalt phase transition was observed upon pressure increase above 15 GPa, persisting in the rocksalt phase up to the highest pressure of this study. Upon pressure release to ambient pressure, a large hysteresis was observed. The sample has also been analyzed using micro-Raman and x-ray diffraction, which suggests pressure-induced amorphisation and the presence of mixed rocksalt and Wurzite phases.

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