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Neighborite, a mineral with chemical composition of NaMgF₃ and crystal structure of the perovskite type, is isostructural and isoelectronic to the MgSiO₃ perovskite^{1,2}. Crystal chemistry of neighborite at high temperature has been extensively studied^{3,4}. We carried out a structural study on neighborite by in-situ x-ray diffraction at high pressure and temperature using the high pressure apparatus SAM85 and monochromatic synchrotron x-ray at the X17B1 beamline. An imaging plate was used to record the diffraction pattern. As shown in Figure 1, the orthorhombic-cubic phase transformation was observed at high pressure. Compared with the published data at room pressure, the transition temperature at 4.3 GPa is about 200°C higher. Therefore the orthorhombic-cubic phase boundary has a positive slope in the P-T phase diagram, which is consistent with the previous study using energy dispersive x-ray diffraction⁵. Further structure analysis will be made by Rietveld refinement to explore the structural distortion at high pressure and temperature. * Work was supported by the NSF under a grant EAR 89-20239 to the Center for High Pressure Research, and US DOE contract# DE-AC02-98CH10886 to the NSLS. 1.Chao, E. C. T., Evans, H., Skinner, B. Milton, C. Neighborite, NaMgF₃, a new mineral from the Green River Formation, South Ouray, Utah. *American Mineralogist* 46, 379 - 393 (1961). 2.O'Keefe, M. Bovin, J.-O. Solid electrolyte behavior of NaMgF₃: Geophysical implications. *Science* 206, 599-600 (1979). 3.Zhao, Y., Weidner, D. J., Parise, J. B. Cox, D. E. Thermal expansion and structural distortion of perovskite - data for NaMgF₃ perovskite. Part I. *Physics of the Earth and Planetary Interiors* 76, 1 - 16 (1993). 4.Zhao, Y., Weidner, D. J., Parise, J. B. Cox, D. E. Thermal expansion and structural distortion of perovskite - data for NaMgF₃ perovskite. Part II. *Physics of the Earth and Planetary Interiors* 76, 17 - 34 (1993). 5.Zhao, Y. et al. Perovskite at high P-T conditions: An in-situ synchrotron X-ray diffraction study of NaMgF₃ perovskite. *Journal of Geophysical Research* 99, 2871 - 2885 (1994).

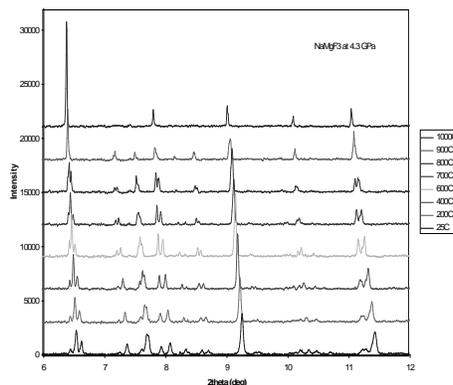


Figure 1. Diffraction patterns of neighborite at high pressure