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High Pressure synchrotron XRD and Raman studies of $Ho_{0.5}Y_{1.5}Ti_2O_7$.[1] MELANIE WHITE, RAVHI KUMAR, JASON BAKER, BRIAN LIGHT, Univ of Nevada - Las Vegas — Pyrochlore oxides are of interest for their spin-frustrated systems and their proposed use in high-level nuclear waste management. We sought to examine the structural stability of these materials under extreme conditions in order to help determine their viability for applications. A compression and decompression study of $Ho_{0.5}Y_{1.5}Ti_2O_7$ was done in approximately 5 GPa intervals to above 55 GPa with both synchrotron powder x-ray diffraction at the Argonne National Laboratory Advanced Photon Source, and Raman spectroscopy at the University of Nevada - Las Vegas High Pressure Science and Engineering Center (HiPSEC). In both studies, pressurization of sample was achieved using a symmetric-style diamond anvil cell (DAC). The results are compared with the high pressure behavior of other rare earth titanates. A reversible phase transition is observed between 45 and 49 GPa in both studies. The x-ray diffraction patterns are analyzed in order to identify the crystal structure of the new phase. Vibrational modes are assigned to the Raman spectra and tracked as a function of pressure. Our poster will discuss the results in detail.

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