

Abstract Submitted  
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**High-pressure equation of state of  $U_3O_8$** <sup>1</sup> JAE-HYUN KLEPEIS, ZSOLT JENEI, MAGNUS LIPP, WILLIAM EVANS, Lawrence Livermore National Laboratory, DMITRY POPOV, HPCAT, APS, Argonne National Laboratory, CHANGYONG PARK, HPCAT APS Argonne National Laboratory — We will present experimental studies at high pressures of the equation of state of  $U_3O_8$ . Isothermal pressure-volume measurements of  $U_3O_8$  were made at ambient/elevated (600 K) temperatures in the pressure range of 1 atm  $\sim$  80 GPa (10  $\sim$  70 GPa). Angle dispersive X-ray diffraction patterns at ambient temperature indicate that the A-centered orthorhombic structure of  $U_3O_8$  transforms to the face centered cubic (fcc) structure above 9 GPa. Both the orthorhombic and cubic phases co-exist between 9 GPa and 30 GPa. As the temperature is increased at 10 GPa, we find that  $U_3O_8$  also transforms to the fcc structure. As the pressure is increased at 600 K, the fcc structure undergoes a phase transition to the body centered tetragonal structure. Since the uranium in  $U_3O_8$  is the dominant x-ray scatterer, the behavior of the oxygen at the phase transitions was measured using Raman spectroscopy.

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