

Abstract Submitted  
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**High Pressure-High Temperature Phase Diagram of Beryllium**

STACI BROWN, ZSOLT JENEI, HYUNCAE CYNN, WILLIAM EVANS, MAGNUS LIPP, JEFFEREY MONTGOMERY, BRUCE BAER, Lawrence Livermore National Laboratory — A detailed understanding of the phase diagram of beryllium impacts fundamental science and technological applications. Despite a simple atomic structure, theoretical modeling of the phase diagram of beryllium has been extremely challenging and remains an area of active investigation [Benedict, PRB 09 and Guo, Comp Mat Sci 14]. Beryllium is important to a range of applications, including structural members, x-ray windows, and nuclear reactors and ICF targets. Extension of the experimental understanding of beryllium will serve to inform and advance theoretical efforts and technological applications. To address these needs, we have extended our previous work [Evans, PRB 05], and performed x-ray diffraction studies of high temperature beryllium. We will describe our measurements of the crystal structure, lattice constants, and phase properties of beryllium at high pressures and temperatures. We will discuss insights into this simple yet challenging system.

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