Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

High Pressure-High Temperature Phase Diagram of Beryllium[1]

M.J. LIPP, B.J. BAER, H. CYNN, Z. JENEI, J.-H. KLEPEIS, W.J. EVANS, LLNL, H.-P. LIERMANN, Y. MENG, S.V. SINOGEIKIN, W. YANG, HPCAT, A. LAZICKI, CIW, Y. OHISHI, SPring-8/JASRI — A detailed understanding of the phase diagram of beryllium and its alloys 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 [Kadas, ,PRB 07]. 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 and melt studies beryllium and beryllium alloys at high pressure. We will describe our measurements of the crystal structure, lattice constants, and melt curve of high-pressure beryllium and beryllium alloys. We will discuss insights into this simple yet challenging system.

[1]This work performed under the auspices of the US DOE by LLNL under Contract DE-AC52-07NA27344. HPCAT use is supported by DOE-BES, DOE-NNSA, NSF, and the W.M. Keck Foundation. APS is supported by DOE-BES, under Contract No. DE-AC02-06CH11357.

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Date submitted: 22 Dec 2008 Electronic form version 1.4