

Abstract Submitted
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High Pressure-Temperature Studies of Vanadium¹ ZS. JENEI, B.J. BAER, H. CYNN, J-H. P. KLEPEIS, M.J. LIPP, W.J. EVANS, LLNL, H.-P. LIERMANN, S.V. SINOGEIKIN, W. YANG, HPCAT — Vanadium, a seemingly simple metal, has captured the interest of high-pressure scientists following the discovery (Ding et al. PRL 2007) of a subtle pressure-induced phase transition from bcc to a rhombohedral phase. Recent first-principles electronic-structure studies (Lee et al. PRB 2008) are consistent with these experiments and extend beyond the range of the measurements, predicting a reentrant phase transition back to bcc at high pressure. We have made x-ray diffraction measurements of the crystal structure and lattice parameters of vanadium at high-pressure and temperature. Detailed comparisons will challenge/validate models and guide development of predictive codes. We will discuss our measurements including high temperature behavior, the EOS, and dependence of the transition pressure on the hydrostatic conditions of the compression/decompression.

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