

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Pressure-induced collapsed-tetragonal phase in SrCo_2As_2 at ambient temperature W. T. JAYASEKARA, U. S. KALUARACHCHI, B. G. UELAND, A. PANDEY, Y. B. LEE, V. TAUFOR, A. SAPKOTA, K. KOTHAPALLI, N. S. SANGEETHA, S. L. BUD'KO, B. N. HARMON, P. C. CANFIELD, D. C. JOHNSTON, A. KREYSSIG, A. I. GOLDMAN, Ames Lab., Dept. of Physics and Astronomy, Iowa State Univ., G. FABBRIS, Y. FENG, L. S. I. VEIGA, Argonne Natl. Lab., A. M. DOS SANTOS, Oak Ridge Natl. Lab. — Our recent high-energy (HE) high-pressure (HP) x-ray powder diffraction measurements on tetragonal (T) SrCo_2As_2 have revealed a first-order pressure-induced structural phase transition to a collapsed tetragonal (cT) phase with a reduction in c by -7.9% and the c/a ratio by -9.9%. The T and cT phases coexist for applied pressures 6 GPa to 18 GPa at 7 K. Resistance measurements up to 5.9 GPa and down to 1.8 K signatures likely associated with the cT phase above 5.5 GPa and found no evidence for superconductivity. Neutron diffraction data show no evidence of magnetic order up to 1.1 GPa. Here, we show that the T to cT transition occurs around 6.8 GPa at ambient temperature, and that the transition is nearly temperature-independent from 300 K down to 7 K, which indicates a steep $p - T$ phase line. Work at Ames Lab. was supported by US DOE, BES, DMSE under DE-AC02-07CH11358. This research used resources at the APS and ORNL, US DOE, SC, User Facilities.

Wageesha T. Jayasekara
Ames Lab., Dept. of Physics and Astronomy, Iowa State Univ.

Date submitted: 06 Nov 2015

Electronic form version 1.4