

Abstract Submitted
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Formation of collapsed tetragonal phase in EuCo_2As_2 under high pressure¹ MATTHEW BISHOP, University of West Georgia (UWG), Carrollton, GA 30118, USA, WALTER UHOYA, GEORGIY TSOI, YOGESH VOHRA, University of Alabama at Birmingham (UAB), Birmingham, AL 35294, USA, ATHENA SEFAT, BRIAN SALES, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN 37831, USA — The structural properties of EuCo_2As_2 have been studied up to 35 GPa, through the use of x-ray diffraction in a diamond anvil cell at a synchrotron source. At ambient conditions, EuCo_2As_2 ($I4/mmm$) has a tetragonal lattice structure with a bulk modulus of 48 ± 4 GPa. With the application of pressure, the *a*-axis exhibits negative compressibility with a concurrent sharp decrease in *c*-axis length. The anomalous compressibility of the *a*-axis continues until 4.7 GPa, at which point the structure undergoes a second-order phase transition to a collapsed tetragonal (CT) state with a bulk modulus of 111 ± 2 GPa. We found a strong correlation between the ambient pressure volume of 122 parents of superconductors and the corresponding tetragonal to collapsed tetragonal phase transition pressures.

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