Structural changes in \( \text{Bi}_2\text{Te}_3 \) under pressure.\(^1\) MATHEW JACOBSEN, RAVHI KUMAR, ANDREW CORNELIUS, HiPSEC and Dep.Physics, University of Nevada Las Vegas, PETER LIERMANN, HPCAT, Argonne National Laboratory — \( \text{Bi}_2\text{Te}_3 \) based compounds continue to receive intense research activities due to the enhanced figure of merit observed in the super lattice structure with \( \text{Sb}_2\text{Te}_3 \) [1]. Synthesis of different chemical compositions with varying particle sizes and doping has gained importance subsequently. The thermo electric properties of the new compositions strongly depend on the structure and \( \text{P-T} \) phase diagram of the parent compound \( \text{Bi}_2\text{Te}_3 \). In order to understand the structural properties of \( \text{Bi}_2\text{Te}_3 \) in detail, we have performed pressure studies up to 30GPa using in situ angle dispersive and energy dispersive x-ray diffraction techniques using a diamond anvil cell with different pressure media. \( \text{Bi}_2\text{Te}_3 \) is found to undergo pressure induced structural transition around 7.8 GPa to a new high pressure phase from the ambient rhombohedral phase. This transition is found to be completely reversible with a large hysteresis observed during downloading. The details of the high pressure phase and the pressure medium dependence of the transition will be discussed further. [1]. Venkatasubramanian et al., Nature, 413, 597 (2001)

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