

Instruction on preparing an abstract for the 57th EHPRG Meeting: Multiple phase transitions of new type phase change materials Sc-Sb₂Te₃

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In new type phase-change chalcogenide material Sc-Sb₂Te₃ (SST), in situ x-ray diffraction experiments reveal an interesting transition sequence, which include pressure-induced polyamorphism and reversible amorphous-crystalline transitions. We have found that the as-deposited amorphous SST (a-SST) has pre-existing nano-crystallines and gradually disappears as the pressure increases, transforming into another a-SST. The high-pressure amorphous eventually transforms into bcc structure phase, which is not directly derived from the transformation of nano-crystallines. The presence of nano-crystallines may not have a catalytic effect on the formation of high-pressure bcc structure phases. Atomic rearrangement under high pressure ultimately leads to the formation of high-pressure bcc structure phases.

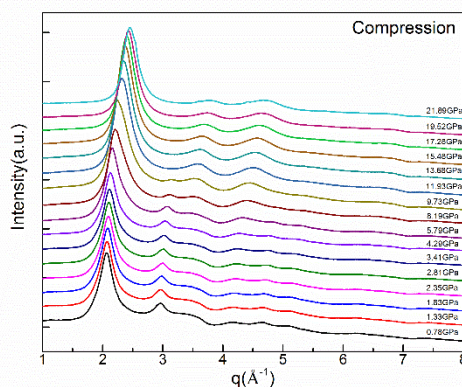


Figure 1. XRD spectra of the SST sample measured in situ under hydrostatic pressure. Note the evolution from low-density amorphous (LDA) to high-density amorphous (HDA) at around 11 GPa. The small and sharp peak comes from nano-crystalline. Its disappearance represents the transition from LPA to HPA.

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