

Abstract Submitted
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Synthesis and Characterization of Sb-Te Phase-change Thin films¹ CHANDRASIRI IHALAWELA, BINAY PRASAI, KEVIN COOPER, DAVID INGRAM, Department of Physics and Astronomy, Ohio University, Athens, Ohio, XIAO-MIN LIN, Center for Nanoscale Materials, Argonne National Lab, Argonne, Illinois, GANG CHEN, Department of Physics and Astronomy, Ohio University, Athens, Ohio — Phase change memory materials (PCMM) are semiconducting chalcogenides that exhibit rapid phase transition under optical or electric pulse excitation. Among various PCMMs, Sb-Te binary has captured full attention due to their high switching performance and is regarded as one of the prototypical PCMMs. In this study, we focused on binary Sb-Te thin films synthesized by an electrochemical method. The advantage of this method over other techniques lies in its high performance in growing nanowires through templates to fulfill the demand of high-density memory devices. Energy dispersive X-ray spectroscopy, X-ray photoelectron spectroscopy, Rutherford backscattering spectroscopy, X-ray diffraction, extended X-ray absorption fine structure, differential scanning calorimetry and four-probe resistance were used to characterize their atomic and electronic structure as well as physical properties. The relations between the structure and properties will be discussed.

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