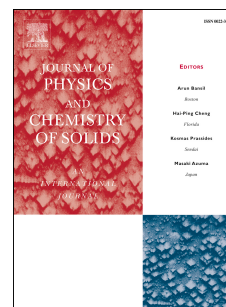


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The influence of film deposition temperature on the subsequent post-annealing and crystallization of sputtered Sb_2S_3 thin films

M.I. Medina-Montes^{a, §}, Z. Montiel-González^b, N. R. Mathews^a, and X. Mathew^{a, *}

^a Instituto de Energías Renovables, Universidad Nacional Autónoma de México, Temixco, Morelos 62580, México.

^b CONACYT-Centro de Investigación en Materiales Avanzados S.C., Unidad Monterrey, Apodaca, Nuevo León 66628, México.

* Corresponding author (X. Mathew), e-mail: xm@ier.unam.mx

§ e-mail: mimm@ier.unam.mx

Abstract:

Sputter-deposited Sb_2S_3 thin films were studied to understand the role of the initial film deposition temperature on the subsequent crystallization during the post-annealing in N_2 -S ambient. The films were deposited with substrate temperatures in the range 200 to 350 °C. The as-deposited films were amorphous independent of the substrate temperature, however, after annealing at 300 °C all the films turned in to polycrystalline. It was observed that the thermal history (deposition temperature) of the films have a notable influence on the crystallization and grain growth due to post-annealing at 300 °C. The material properties of the annealed film such as: crystallite size, strain, grain size, refractive index, and film stoichiometry showed a dependence on the original film deposition temperature. Furthermore, AFM and SEM micrographs revealed a direct dependence of the morphological features such as grain growth, uniformity and compactness on the thermal history. Studies by variable-angle spectroscopic ellipsometry (VASE) provided some optical parameters including inter-band transitions in the Sb_2S_3 thin films. We present the

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