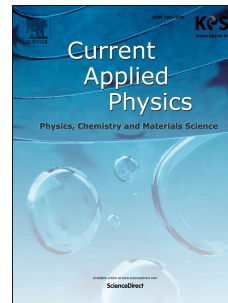


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Tanka Raj Rana, JunHo Kim



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Phase engineering of CBD grown tin sulfide films by post-sulfurization and solar cell application

Tanka Raj Rana, JunHo Kim*

Department of Physics, Incheon National University, 119 Academy-ro, Yeonsu-gu, Incheon 22012, Korea

Abstract

We report on post-annealing effects on structures, compositions and surface morphology of chemical bath deposition (CBD) grown tin sulfide thin films. For post-annealing of as-grown tin sulfide films, we carried out three types of sulfurization at different temperatures. As grown tin sulfide films followed by sulfurization at different conditions showed modified surface morphologies and crystalline phases; SnS, Sn₂S₃ and SnS₂ according to the sulfurization conditions. Experimental results showed that these earth-abundant thin films could be engineered to have different structural, electrical and optical properties by simple post-sulfurization process, possessing significant potentials for wide fields of applications. Moreover, we made solar cell using SnS as photo absorber, which showed ~0.1% power conversion efficiency.

Keywords: CBD, tin sulfide, post-sulfurization, crystal structure, solar cell

*Corresponding author: JunHo Kim

Email: jhk@inu.ac.kr

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