

Effects of annealing temperature on properties of CuIn (Se,S)₂ film prepared by sputtering

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Abstract

This paper examines CuIn(Se,S)₂ (CISS) films prepared by sputtering precursor films of In, Cu, and In₂S₃ onto Mo coated soda-lime glass, followed by a single-stage selenium annealing process to form a CISS chalcopyrite phase. In this study, S was substituted for Ga to increase the energy gap of CuInSe-based materials. Experimental results reveal that the composition of (S + Se) and S decreased slightly with an increase in the selenium annealing temperature, exhibiting uniform distribution throughout the entire CISS film sample. The resulting CISS film exhibited p-type conductivity with an energy gap of 1.11eV. The optimum selenium annealing condition for the CIGS precursor prepared by sputtering was 798 K for 20 minutes.

Key words: Chalcopyrite;CuIn(Ga)Se₂;Sputtering