

CIG-Se bi-layer structure for the preparation of CIGSe thin films

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Copper indium gallium diselenide (CIGSe) is one of the most promising candidates in the family of chalcopyrite materials for the photovoltaic application. For the preparation of CIGSe thin films, chemical solution deposition (CSD) methods like the spin coating are studied due to their low cost and simple process. In the case of conventional CSD processes for CIGSe thin films, post annealing of as-deposited CIGSe thin films in the atmosphere of Se vapor or H₂Se gas is inevitable. However, the usage of Se vapor or H₂Se gas is very harmful to human and less efficient in terms of material usage. In this work, for more safe and efficient supply of Se into the precursor thin films, bi-layer structure of CIG-Se was proposed for the preparation of CIGSe thin films. CIG-Se bi-layer thin films were prepared by CSD of CIG precursor and followed evaporation of Se on the CIG precursor. The CIG-Se bi-layers were then treated by the rapid thermal process for the growth of CIGSe thin films. The properties of prepared CIGSe thin films were analyzed using X-ray diffraction (XRD), scanning electron microscope (SEM), energy dispersive spectrometry (EDS), and UV-visible spectrophotometer.