INFLUENCE OF SUBSTRATE TEMPERATURE ON THE PROPERTIES OF RF SPUTTERED TIN SULFIDE THIN FILMS FOR SOLARCELL APPLICATIONS

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Semiconductor binary compound SnS has great significance as p-type chalcogenide absorber for photovoltaic applications. It shows high absorption coefficient of \(10^4\) cm\(^{-1}\) and optimal bandgap range from 1.1–1.4 eV. Theoretically, maximum power conversion efficiency of SnS is more than 25% based on Shockley–Queasier limit. SnS has become best alternative for commercially available like CdTe, CIS, and CIGS thin film based solar cells with its non-toxic and inexpensive earth abundant elements. In this report, we present the influence of substrate temperature on the structural, optical and electrical properties of rf sputtered SnS thin films grown on Mo/SLG by using SnS target. The deposited SnS films were characterized by scanning electron microscopy, electron dispersive spectroscopy, X-ray diffraction, micro Raman spectroscopy, and UV-Visible spectroscopy. X-ray diffraction spectra confirmed that a dominant SnS pure phase of herzenbergite crystal structure existed with (101) and (111) as major orientation peaks. We will further discuss the properties of solar cell with structure SLG/Mo/SnS/CdS/i-ZnO/ITO/Al.