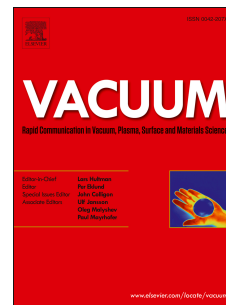


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Na Incorporated Improved Properties of $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) Thin Film by DC Sputtering

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Abstract- Polycrystalline CZTS is an emerging candidate for photovoltaic, optoelectronic and gas sensing applications due to its availability and enviro-friendly nature and also favorable light harvesting properties. The properties of polycrystalline materials depend upon the grain size. Grain size can be increased by increasing the annealing time, but this may lead to increased cost and also evaporation of certain volatile and low melting materials. Adding some growth enhancing elements is one of the novel methods to improve the grain size of polycrystalline materials. In this study, we studied Na induced CZTS film prepared by sputtering method. Before sulfurization, NaF (~30 nm) thin layer was deposited on deposited CZT film using thermal evaporation method. UV-Visible, XRD and SEM/EDS analysis were used for studying optical, structural, elemental and morphological properties of films.

Keywords: $\text{Cu}_2\text{ZnSnS}_4$ (CZTS); DC magnetron sputtering; Na-doping; Thin Film; Sulfurization.

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