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Photo conversion efficiency of CZTS solar cellsfabricatedusingZnO as a buffer layer

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Abstract: Quaternary Cu_2ZnSnS_4 (CZTS), a P-type semiconducting material with a direct band gap of 1.4 to 1.5 eV and high absorption coefficient (10^4 cm^{-1}) in the visible range has been considered as an alternative absorber layer in the fabrication of solar cells.ZnO is a wide-gap n-typematerial, consisting of abundant and nontoxic elements, andis thus expected to be a good substitute for CdS buffer layer in solar cells.In this paper, we report the study of CZTS and ZnOnanoparticles synthesized by solvothermalmethod.The structural, optical and electrical properties of prepared nanoparticles were studied using X-ray powder diffraction (XRD), Raman analysis, scanning electron microscopy (SEM), UV-vis absorption and J-V Characteristic studies.The device fabrication and conversionefficiency of CZTS/ZnOsolarcellsare also discussed.

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