

Solar cells based on $\text{Cu}_2\text{ZnSnS}_4/\text{n-Si}$ heterojunction

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The semiconducting compound $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) is made up earth-abundant, low-cost and non-toxic elements, which make it an ideal candidate to replace $\text{Cu}(\text{In,Ga})\text{Se}_2$ (CIGS) and CdTe solar cells which face material scarcity and toxicity issues. In addition, as an important compound thin film absorber material, CZTS exhibits superior optical and electronic properties, as well as a suitable band gap (approx. 1.5 eV). It is well known that CZTS has a great light absorption coefficient of more than 10^4cm^{-1} in the visible light region, and its theoretical power conversion efficiency (PCE) is more than 30%.

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