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Modeling and simulation of CZTS-perovskite sandwiched tandem solar cell

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The solar cell capacitance simulator (SCAPS-1D) was used in the modeling and simulation of sandwiched Perovskite solar cells (PSCs) with planar hetero-junction structure in the arrangement of the sandwiched model (FTO/ZnO/CZTS/PSCS/CZTS/HTM). Two different configurations “121 and 111” of sandwiching absorber layer of the device were simulated and compared with the Perovskite without a sandwich, using absorber layer of step length thickness of 25nm, and varied from 100nm to 500nm. The band gap diagram, I-V characteristics curve, and other parameters were constructed. The best configuration for better performance was then determined, from which further simulations were carried out. The efficiency of 22.57% was achieved, which shows that having a combination of two different absorbers was achievable with considerable photon conversion efficiency.

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