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Numerical simulation of perovskite solar cell with porous silicon layer

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ABSTRACT

As one of the most promising photovoltaic technologies, perovskite solar cells have attracted attention with several properties and high efficiency. In this paper, a p-i-n perovskite solar cell with the structure of (PSi/CuO/$CH_3NH_3PbI_3$/ZnO) was investigated using solar cell capacitance simulator which has achieved a power conversion efficiency of η ~ 8.69%. In order to investigate its performance, porous silicon (PSi) was suggested to know its impact on this structure. The results reveal significantly the effect of porous silicon on the performance of solar cell's structure. We studied the influence of thickness and band gap of absorber layer also dopant concentration of PSi layer. The results demonstrated the highest agreement with the experiments.

Keywords: Perovskite solar cell; Porous silicon; Efficiency; Solar cell capacitance simulator

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