عنوان مقاله:
Design and simulation of a high efficiency CdS/CdTesolar cell

محل انتشار:
چهارمین کنفرانس بین المللی مهندسی برق، کامپیوتر، مکانیک و هوش مصنوعی (سال: 1402)

تعداد صفحات اصل مقاله: 13

نویسنده:
Faranak malekian

خلاصه مقاله:
A thin film solar cell based on cadmium telluride (CdTe) has been investigatedby means of an accurate numerical simulation study. To optimize the design interms of power conversion effi- ciency, we have studied the influence ofdoping concentration and carrier lifetime in the CdTe layer as well as theimpact of different geometrical parameters in defining the device structure. Inmore detail, the solar cell consists of a fluorine doped tin oxide layer stacked,from top to bottom, on a highly resistive transparent film, a n-type layer ofcadmium sulphide (CdS), and a p-type CdTe absorber layer. A good agreementbetween the simulation results and recent experimental data taken fromliterature has been achieved. The optimized design performs a short-circuitcurrent density of ۲۹.۰۹ mA/cm۲, an open-circuit voltage of ۰.۹۵ V, a fillfactorof ۸۳.۴۷ %, and a conversion efficiency on the order of ۲۳ % under airmass ۱.۵ global spectrum (AM۱.۵G) with an incident irradiance of ۱۰۰۰W/m۲.

کلمات کلیدی:
CdTe solar cell Numerical simulations Fill-factor Conversionefficiency

لینک ثابت مقاله در پایگاه سیویلیکا: