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STUDY OF CIGS PSEUDO-HOMOJUNCTION THIN FILM SOLAR CELL USING SCAPS-1D

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Abstract:) have been used as indicators to evaluate the device performances. Simulation outcomes have proved that for a best performance for CIGS P-HTFSC device, the optimal thickness for CIGS and ODC layers should be small than 2 µm and few nm, respectively, while the optimal defect concentration within the layer should be 10hThe present modelling study reports the performance of defected CIGS pseudo-homojunction thin film solar cell (P-HTFSC) and determines its optimum parameters for high performance using the Scaps-1D software under the AM1.5 illumination and the operating temperature of 300 K. To focus the discussion on the optimal parameters (thickness, doping concentrations, deep/interface defect concentrations and bandgap) for the ZnO, CdS, ODC and CIGS thin film layers, cross sectional (1D) simulations have been performed on the ZnO/CdS/ODC/CIGS P-HTFSC device for obtaining its optimal structure that confers high light-into-electricity conversion efficiency. The four light J-V characteristics (short-circuit current: JSC, open-circuit voltage: VOC, fill factor: FF and conversion efficiency:13 cm-3 and between 1013 cm-3-1018 cm-3, respectively.

Keywords : CIGS, J-V characteristics, ODC, Pseudo-homojunction, Scaps-1D