Abstract

Numerical Modeling, Simulation and Optimization of High Performance three layers CIGS Solar cell have been carried out in this paper using AMPS-1D (Analysis for Microelectronic and Photonic Structures). CIGS thin film hetero-junction solar cell simulation is performed to find out the influence of particular layer material electrical, optical and geometric parameters on overall cell performance. Based on the simulation results, Optimization is performed by choosing the optimum value of all input parameters from observation of overall cell performance over wide range of individual input parameter variation. The values for input parameters of three layers are chosen from literature values, theoretical values and numerical data. Current tested maximum CIGS solar cell efficiency is 20.3%. This proposed model provides simulated efficiency of 21.613% from simulation by AMPS-1D software in LIFETIME model while lifetime is approximated 1ns.

References
- Shirish Pethe, 2004. Optimization of the two stage process for Cu(In,Ga)Se2 solar cells

**Index Terms**

Computer Science

Applied Sciences

**Keywords**

Cu(In, Ga)Se2 (CIGS) thin film solar cell AMPS-1D simulation Efficiency open circuit voltage (Voc)

short circuit current (Jsc)

fill factor(FF)