

Fabrication and Electrical Characterization of Vacuum Deposited n-CdTe/p-ZnTe Heterojunction Diodes

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The study of n-CdTe/p-ZnTe heterojunctions is of vital importance for the fabrication of single junction and tandem solar cells. In the present research work n-CdTe/p-ZnTe heterojunction diodes were prepared by high vacuum deposition technique. The growth conditions required for obtaining desired quality n-CdTe and p-ZnTe films were optimized by performing a series of trials. The n-CdTe/p-ZnTe heterojunctions were prepared by first depositing CdTe film on glass substrate and then depositing ZnTe film on top of CdTe. Detailed electrical characterization of the heterojunction was performed. The conduction in the heterojunction was predominantly due to thermionic emission at low voltages. However at higher voltages space charge limited conduction was found to be dominant. Many technically important parameters such as barrier height, width of the depletion region, carrier concentration etc were deduced by studying the I-V and C-V characteristics of the heterojunction. The activation energies of ZnTe and CdTe were determined by studying the variation of resistance with ambient temperature and a theoretical band diagram of the heterojunction was drawn using Anderson's model.

References

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