

Cu(In,Ga)Se₂-based solar cell: from know-how toward understanding ?

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Abstract:

CuIn_{1-x}Ga_xSe₂ (CIGSe)-based solar cell is the only thin film technology surpassing 20 % efficiency. Such a performance level can appear surprising because:

- all of the layers constituting the device are polycrystalline (many homo-interfaces),
- the device is composed of five different materials (many hetero-interfaces),
- the CIGSe material cannot be extrinsically doped (no direct control of the carrier density).

The industrial implementation of this solar panel technology led the scientific community to further understand the correlation between the layers synthesis process, achieved material properties and device behaviour.

The purpose of the present contribution is to give an overview of the recent progress in the understanding of CIGSe thin film properties and in the role of the homo- and hetero-interfaces in the cell operation.