

Semi-transparent CIGSe solar cell with alternative back contact

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Resume :

The fabrication of semitransparent thin film solar cell based on Cu(In,Ga)Se_2 needs a substitution of molybdenum as back contact. The structure is the stack Glass/ ZnO:Al /CIGSe/ CdS / ZnO / ZnO:Al . The work involves optimizing the optical and electrical properties of the back contact made of ZnO:Al , deposited by RF-sputtering. Moreover, the thin film of CIGSe needs to have a high gallium rate at the CIGSe/ ZnO:Al interface, so an unusual deposition process is used, referenced to as CURO process. This structure permits to obtain cells with a 12% power conversion efficiency with a 700 nm thin absorber and a 50% transmission beyond the semiconductor band gap. First results are promising and show the suitability of the choice of ZnO:Al as an alternative to molybdenum as back contact. Then, some alternative back contact will be investigated and tandem solar cell with CIGSe and crystalline silicon will be realized. Key word: semitransparent solar cell, tandem solar cell, thin film, Cu(In,Ga)Se_2 , ZnO:Al , CURO process, alternative back contact.