



## Processing of CuInSe<sub>2</sub>-Based Solar Cells: Characterization of Deposition Processes in Terms of Chemical Reaction Analyses

By National Renewable Energy Laboratory (NREL)

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*.This report describes research performed by the University of Florida during Phase II of this subcontract. First, to study CIGS, researchers adapted a contactless, nondestructive technique previously developed for measuring photogenerated excess carrier lifetimes in SOI wafers. This dual-beam optical modulation (DBOM) technique was used to investigate the differences between three alternative methods of depositing CdS (conventional chemical-bath deposition [CBD], metal-organic chemical vapor deposition [MOCVD], and sputtering). Second, a critical assessment of the Cu-In-Se thermochemical and phase diagram data using standard CALPHAD procedures is being performed. The outcome of this research will produce useful information on equilibrium vapor compositions (required annealing ambients, Sex fluxes from effusion cells), phase diagrams (conditions for melt-assisted growth), chemical potentials (driving forces for diffusion and chemical reactions), and consistent solution models (extents of solid solutions and extending phase diagrams). Third, an integrated facility to fabricate CIS PV devices was established that includes migration-enhanced epitaxy (MEE) for deposition of CIS, a rapid thermal processing furnace for absorber film formation, sputtering of ZnO, CBD or MOCVD of CdS, metallization, and pattern definition.



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