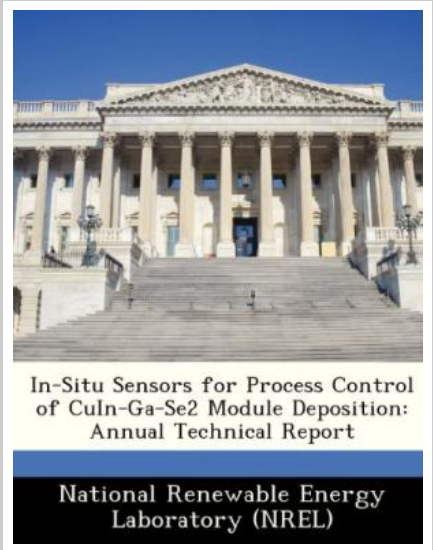

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In-Situ Sensors for Process Control of Cuin-Ga-Se2 Module Deposition: Annual Technical Report

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 *****.Materials Research Group (MRG), Inc. is developing in-situ sensors to improve yield, reproducibility, average efficiency, and prevention of lost processes. In-situ X-ray fluorescence (XRF) will be used to monitor composition and thickness of deposited layers, and in-situ optical emission spectroscopy (OES) will be used to provide real-time feedback describing the deposition plasma. Characterization techniques are to be examined ex-situ in the first two years of the contract, and applied to existing deposition systems in the final year. Progress toward achieving these goals during Phase I includes: a)Development and verification of an XRF simulation tool to troubleshoot measurements, to predict difficulties in XRF interpretation, and to calculate quantities needed in the translation from XRF signal to composition; b) Examination of the implication of sample conditions unique to CIGS photovoltaics - such as varying Ga gradients, intermediate film thicknesses where neither thick-film nor thin-film approximations are valid, variations in back-contact thickness, multiple layers, variations in substrate composition and thickness - on XRF interpretation; c) Fabrication of CIGS samples and test structures for XRF measurements; d) Execution and interpretation of XRF...

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