Chalcogenide photovoltaics physics technologies and thin film devices

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This first comprehensive description of the most important material properties and device aspects closes the gap between general books on solar cells and journal articles on chalcogenide-based photovoltaics.

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The properties of the Mo film and the choice of the substrate are of prime importance for the final device quality. A wide variety of thin-film deposition methods has been used to deposit CIGS thin films. The chapter discusses the intrinsic stability of CIGS and the global chemical stability of the device.

We review prior and on-going works in using laser annealing (LA) techniques in the development of chalcogenide-based [CdTe and Cu(In,Ga)(S,Se)2] solar cells. LA can achieve unique processing regimes as the wavelength and pulse duration can be chosen to selectively heat particular layers of a thin film solar cell or even particular regions within a single layer. Pulsed ...

Prof. Dr. Roland Scheer. Martin-Luther Universität Halle-Wittenberg, Naturwissenschaftliche Fakultät II, Institut für Physik/Fachgruppe, Photovoltaik, Von Dankelmann-Platz 3, 06120 Halle (Saale), Germany

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Chalcogenide thin film solar cells are based on chalcogenide absorbers, like CdTe, Cu(In,Ga)Se 2, or Cu 2 ZnSn(S,Se) 4.This chapter discusses the electronic band structure of a typical thin film solar cell, which is based on a p/n heterojunction, together with the role and some fundamental design rules of the different layers and their interfaces.

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Chalcogenide Photovoltaics Physics, Technologies, and Thin Film Devices ... 2 Thin Film Heterostructures Today, thin film chalcogenide photovoltaic devices are fabricated in the form of heterostructures. An example is p-type CdTe in contact with n-type CdS and n-type SnO2 . CdTe is the absorber, CdS the buffer, and SnO2 the window.

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