

1. Record Nr.	UNINA9910437930503321
Autore	Böer Karl W
Titolo	Handbook of the Physics of Thin-Film Solar Cells // by Karl W. Böer
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2013
ISBN	3-642-36748-8
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (893 p.)
Disciplina	537.622 620.44 621 621.042
Soggetti	Renewable energy resources Semiconductors Microwaves Optical engineering Physics Lasers Photonics Materials—Surfaces Thin films Renewable and Green Energy Microwaves, RF and Optical Engineering Applied and Technical Physics Optics, Lasers, Photonics, Optical Devices Surfaces and Interfaces, Thin Films
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	From the Contents: Structure and growth of semiconductors -- Creation and motion of lattice defects -- Photochemical reactions -- Lattice defects, grain boundaries, surfaces, interfaces -- Shallow level centers -- Deep level centers -- Carrier scattering at low fields (phonons, small defects) -- Carrier mobility influenced by large defects

-- Highly doped semiconductors -- Drift, diffusion currents and quasi Fermi levels -- Electron statistics, Boltzmann, Fermi-Dirac.-Electron generation and tunneling, quasi Fermi levels.

Sommario/riassunto

This handbook is a compendium giving a comprehensive description of the basics of semiconductor physics relevant to the design and analysis of thin film solar cell materials. It starts from the basics of material science, describing the material and its growth, defect and electrical properties, the basics of its interaction with photons and the involved statistics, proceeding to space charge effects in semiconductors and pn-junctions. Most attention is given to analyze homo- and hetero-junction solar cells using various models and applying the field-of-direction analysis for discussing current voltage characteristics, and helping to discover the involvement of high-field effects in solar cells. The comprehensive coverage of the main topics of - and relating to - solar cells with extensive reference to literature helps scientists and engineers at all levels to reach a better understanding and improvement of solar cell properties and their production. The author is one of the founders of thin film solar cell research.
