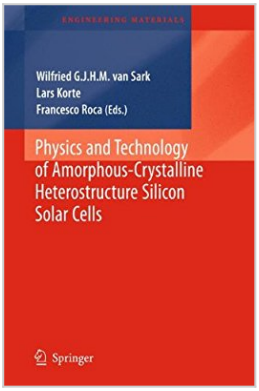

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Today’s solar cell multi-GW market is dominated by crystalline silicon (c-Si) wafer technology, however new cell concepts are entering the market. One very promising solar cell design to answer these needs is the silicon hetero-junction solar cell, of which the emitter and back surface field are basically produced by a low temperature growth of ultra-thin layers of amorphous silicon. In this design, amorphous silicon (a-Si:H) constitutes both „emitter“ and „base-contact/back surface field“ on both sides of a thin crystalline silicon wafer-base (c-Si) where the electrons and holes are photogenerated; at the same time, a-Si:H passivates the c-Si surface. Recently, cell efficiencies above 23% have been demonstrated for such solar cells.

In this book, the editors present an overview of the state-of-the-art in physics and technology of amorphous-crystalline heterostructure silicon solar cells. The heterojunction concept is introduced, processes and resulting properties of the materials used in the cell and their heterointerfaces are discussed and characterization techniques and simulation tools are presented.

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- Sales Rank: #5353454 in Books
- Published on: 2011-10-27
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x 1.31" w x 6.14" l, 2.21 pounds
- Binding: Hardcover
- 582 pages

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Editorial Review

From the Back Cover

The challenge of developing photovoltaic (PV) technology to a cost-competitive alternative for established energy sources can be achieved using simple, high-throughput mass-production compatible processes. Issues to be addressed for large scale PV deployment in large power plants or in building integrated applications are enhancing the performance of solar energy systems by increasing solar cell efficiency, using low amounts of materials which are durable, stable, and abundant on earth, and reducing manufacturing and installation cost. Today’s solar cell multi-GW market is dominated by crystalline silicon (c-Si) wafer technology, however new cell concepts are entering the market. One very promising solar cell design to answer these needs is the silicon hetero-junction solar cell, of which the emitter and back surface field are basically produced by a low temperature growth of ultra-thin layers of amorphous silicon. In this design, amorphous silicon (a-Si:H) constitutes both "emitter" and "base-contact/back surface field" on both sides of a thin crystalline silicon wafer-base (c-Si) where the photogenerated electrons and holes are generated; at the same time, a Si:H passivates the c-Si surface. Recently, cell efficiencies above 23% have been demonstrated for such solar cells. In this book, the editors present an overview of the state-of-the-art in physics and technology of amorphous-crystalline heterostructure silicon solar cells.

Users Review

From reader reviews:

Eric Ray:

Now a day people that Living in the era everywhere everything reachable by match the internet and the resources within it can be true or not involve people to be aware of each details they get. How people have to be smart in having any information nowadays? Of course the correct answer is reading a book. Looking at a book can help persons out of this uncertainty Information especially this Physics and Technology of Amorphous-Crystalline Heterostructure Silicon Solar Cells (Engineering Materials) book as this book offers you rich info and knowledge. Of course the info in this book hundred pct guarantees there is no doubt in it everbody knows.

Eric McDonald:

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Marianne Guzman:

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