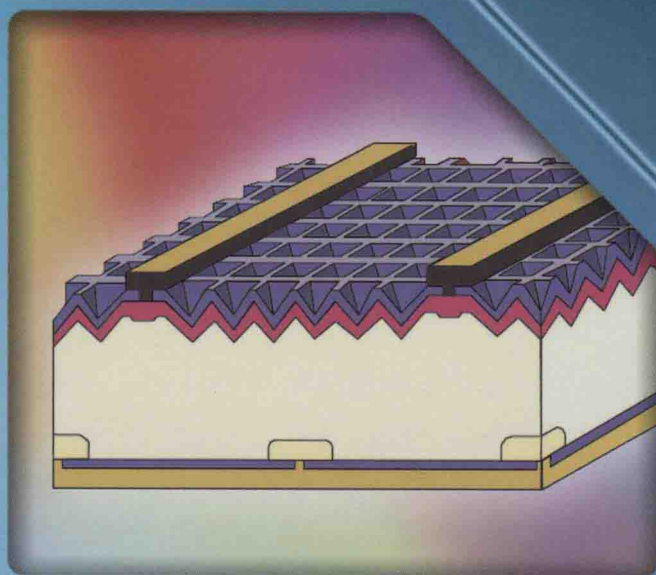


Edited by  
**Gavin J. Conibeer**  
**Arthur Willoughby**

# Solar Cell Materials

Developing  
Technologies



Wiley Series  
in Materials for  
Electronic  
& Optoelectronic  
Applications

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# **Solar Cell Materials**

## **Developing Technologies**

***Edited by***

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# **Solar Cell Materials**

## **Developing Technologies**

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*This book is dedicated to our wives, Julie and Jenni, without whose support it would not have been possible.*



# Series Preface

## WILEY SERIES IN MATERIALS FOR ELECTRONIC AND OPTOELECTRONIC APPLICATIONS

This book series is devoted to the rapidly developing class of materials used for electronic and optoelectronic applications. It is designed to provide much-needed information on the fundamental scientific principles of these materials, together with how these are employed in technological applications. The books are aimed at (postgraduate) students, researchers and technologists, engaged in research, development and the study of materials in electronics and photonics, and industrial scientists developing new materials, devices and circuits for the electronic, optoelectronic and communications industries.

The development of new electronic and optoelectronic materials depends not only on materials engineering at a practical level, but also on a clear understanding of the properties of materials, and the fundamental science behind these properties. It is the properties of a material that eventually determine its usefulness in an application. The series therefore also includes such titles as electrical conduction in solids, optical properties, thermal properties, and so on, all with applications and examples of materials in electronics and optoelectronics. The characterization of materials is also covered within the series in as much as it is impossible to develop new materials without the proper characterization of their structure and properties. Structure-property relationships have always been fundamentally and intrinsically important to materials science and engineering.

Materials science is well known for being one of the most interdisciplinary sciences. It is the interdisciplinary aspect of materials science that has led to many exciting discoveries, new materials and new applications. It is not unusual to find scientists with a chemical engineering background working on materials projects with applications in electronics. In selecting titles for the series, we have tried to maintain the interdisciplinary aspect of the field, and hence its excitement to researchers in this field.

ARTHUR WILLOUGHBY  
PETER CAPPER  
SAFA KASAP





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# Contents

<b>Series Preface</b>	<b>xiii</b>
<b>List of Contributors</b>	<b>xv</b>
<b>1 Introduction</b>	<b>1</b>
<i>Gavin Conibeer and Arthur Willoughby</i>	
1.1 Introduction	1
1.2 The Sun	1
1.3 Book Outline	3
References	4
<b>2 Fundamental Physical Limits to Photovoltaic Conversion</b>	<b>5</b>
<i>J.F. Guillemoles</i>	
2.1 Introduction	5
2.2 Thermodynamic Limits	8
2.2.1 The Sun is the Limit	9
2.2.2 Classical Thermodynamics Analysis of Solar Energy Conversion	10
2.3 Limitations of Classical Devices	12
2.3.1 Detailed Balance and Main Assumptions	13
2.3.2 p-n Junction	14
2.3.3 The Two-Level System Model	17
2.3.4 Multijunctions	19
2.4 Fundamental Limits of Some High-Efficiency Concepts	22
2.4.1 Beyond Unity Quantum Efficiency	23
2.4.2 Beyond Isothermal Conversion: Hot-Carrier Solar Cells (HCSC)	29
2.4.3 Beyond the Single Process/ Photon: Photon Conversion	32
2.5 Conclusion	33
Note	33
References	33
<b>3 Physical Characterisation of Photovoltaic Materials</b>	<b>35</b>
<i>Daniel Bellet and Edith Bellet-Amalric</i>	
3.1 Introduction	35
3.2 Correspondence between Photovoltaic Materials Characterisation Needs and Physical Techniques	35
3.3 X-Ray Techniques	36
3.3.1 X-Ray Diffraction (XRD)	37
3.3.2 Grazing-Incidence X-Ray Diffraction (GIXRD)	40

3.3.3	X-Ray Reflectivity (XRR)	42
3.3.4	Other X-Ray Techniques	44
3.4	Electron Microscopy Methods	45
3.4.1	Electron–Specimen Interactions and Scanning Electron Microscopy (SEM)	48
3.4.2	Electron Backscattering Diffraction (EBSD)	49
3.4.3	Transmission Electron Microscopy (TEM)	51
3.4.4	Electron Energy Loss Spectroscopy (EELS)	52
3.5	Spectroscopy Methods	53
3.5.1	X-Ray Photoelectron Spectroscopy (XPS)	53
3.5.2	Secondary Ion Mass Spectrometry (SIMS)	55
3.5.3	Rutherford Backscattering Spectrometry (RBS)	56
3.5.4	Raman Spectroscopy	56
3.5.5	UV-VIS-NIR Spectroscopy	58
3.6	Concluding Remarks and Perspectives	59
	Acknowledgements	60
	References	60
<b>4</b>	<b>Developments in Crystalline Silicon Solar Cells</b>	<b>65</b>
	<i>Martin A. Green</i>	
4.1	Introduction	65
4.2	Present Market Overview	66
4.3	Silicon Wafers	67
4.3.1	Standard Process	67
4.3.2	Multicrystalline Silicon Ingots	70
4.3.3	Ribbon Silicon	71
4.4	Cell Processing	73
4.4.1	Screen-Printed Cells	73
4.4.2	Buried-Contact and Laser Doped, Selective-Emitter Solar Cells	76
4.4.3	HIT Cell	77
4.4.4	Rear-Contact Cell	78
4.4.5	PERL Solar Cell	79
4.5	Conclusion	82
	Acknowledgements	82
	References	82
<b>5</b>	<b>Amorphous and Microcrystalline Silicon Solar Cells</b>	<b>85</b>
	<i>R.E.I. Schropp</i>	
5.1	Introduction	85
5.2	Deposition Methods	87
5.2.1	Modifications of Direct PECVD Techniques	88
5.2.2	Remote PECVD Techniques	89
5.2.3	Inline HWCVD Deposition	91

5.3	Material Properties	91
5.3.1	Protocrystalline Silicon	92
5.3.2	Microcrystalline or Nanocrystalline Silicon	93
5.4	Single-Junction Cell	96
5.4.1	Amorphous (Protocrystalline) Silicon Cells	98
5.4.2	Microcrystalline ( $\mu\text{c-Si:H}$ ) Silicon Cells	99
5.4.3	Higher Deposition Rate	101
5.5	Multijunction Cells	102
5.6	Modules and Production	103
	Acknowledgments	106
	References	106
<b>6</b>	<b>III-V Solar Cells</b>	<b>113</b>
	<i>N.J. Ekins-Daukes</i>	
6.1	Introduction	113
6.2	Homo- and Heterojunction III-V Solar Cells	115
6.2.1	GaAs Solar Cells	117
6.2.2	InP Solar Cells	120
6.2.3	InGaAsP	121
6.2.4	GaN	121
6.3	Multijunction Solar Cells	122
6.3.1	Monolithic Multijunction Solar Cells	123
6.3.2	Mechanically Stacked Multijunction Solar Cells	129
6.4	Applications	131
6.4.1	III-V Space Photovoltaic Systems	131
6.4.2	III-V Concentrator Photovoltaic Systems	132
6.5	Conclusion	134
	References	134
<b>7</b>	<b>Chalcogenide Thin-Film Solar Cells</b>	<b>145</b>
	<i>M. Paire, S. Delbos, J. Vidal, N. Naghavi and J.F. Guillemoles</i>	
7.1	Introduction	145
7.2	CIGS	148
7.2.1	Device Fabrication	148
7.2.2	Material Properties	162
7.2.3	Device Properties	171
7.2.4	Outlook	181
7.3	Kesterites	185
7.3.1	Advantages of CZTS	185
7.3.2	Crystallographic and Optoelectronic Properties	187
7.3.3	Synthesis Strategies	190
	Acknowledgements	196
	References	196

<b>8 Printed Organic Solar Cells</b>	<b>217</b>
<i>Claudia Hoth, Andrea Seemann, Roland Steim, Tayebah Ameri, Hamed Azimi and Christoph J. Brabec</i>	
8.1 Introduction	217
8.2 Materials and Morphology	218
8.2.1 Organic Semiconductors	219
8.2.2 Control of Morphology in oBHJ Solar Cells	224
8.2.3 Monitoring Morphology	233
8.2.4 Numerical Simulations of Morphology	235
8.2.5 Alternative Approaches to Control the Morphology	235
8.3 Interfaces in Organic Photovoltaics	237
8.3.1 Origin of $V_{oc}$	237
8.3.2 Determination of Polarity-Inverted and Noninverted Structure	238
8.3.3 Optical Spacer	239
8.3.4 Protection Layer between the Electrode and the Polymer	240
8.3.5 Selective Contact	240
8.3.6 Interface Material Review for OPV Cells	240
8.4 Tandem Technology	243
8.4.1 Theoretical Considerations	243
8.4.2 Review of Experimental Results	248
8.4.3 Design Rules for Donors in Bulk-Heterojunction Tandem Solar Cells	255
8.5 Electrode Requirements for Organic Solar Cells	257
8.5.1 Materials for Transparent Electrodes	258
8.5.2 Materials for Nontransparent Electrodes	263
8.6 Production of Organic Solar Cells	265
8.7 Summary and Outlook	273
References	273
<b>9 Third-Generation Solar Cells</b>	<b>283</b>
<i>Gavin Conibeer</i>	
9.1 Introduction	283
9.2 Multiple-Energy-Level Approaches	285
9.2.1 Tandem Cells	285
9.2.2 Multiple-Exciton Generation (MEG)	291
9.2.3 Intermediate-Band Solar Cells (IBSC)	293
9.3 Modification of the Solar Spectrum	294
9.3.1 Downconversion, $QE > 1$	294
9.3.2 Upconversion of Below-Bandgap Photons	297
9.4 Thermal Approaches	302
9.4.1 Thermophotovoltaics (TPV)	303
9.4.2 Thermophotonics	303
9.4.3 Hot-Carrier Cells	303
9.5 Other Approaches	308
9.5.1 Nonreciprocal Devices	308
9.5.2 Quantum Antennae – Light as a Wave	308

9.6 Conclusions	309
Acknowledgements	309
References	310
<b>Concluding Remarks</b>	<b>315</b>
<i>Gavin Conibeer and Arthur Willoughby</i>	
<b>Index</b>	<b>319</b>



