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CONTENTS

Preface ........................................................................................................................................... xv

Materials Research Society Symposium Proceedings ................................................................... xvi

OPTICAL CHARACTERIZATION

Multichannel Mueller Matrix Analysis of the Evolution of Surface Roughness on Different In-Plane Scales During Polycrystalline Film Processing ...................................................... 3
  Chi Chen, Christoph Ross, C.R. Wronski, and R.W. Collins

Real Time Analysis of Magnetron-Sputtered Thin-Film CdTe by Multichannel Spectroscopic Ellipsometry ..................................................................................................................................... 9

Effect of Cu Deficiency on CuIn_{1-x}Ga_{x}Se_{2} and High-Efficiency Photovoltaic Solar Cells ................................................................................................................................. 15
  Sung-Ho Han, Falah S. Hasoon, Joel W. Pankow, Allen M. Hermann, and Dean H. Levi

Analysis of Cu(InGa)Se_{2} Alloy Film Optical Properties and the Effect of Cu Off-Stoichiometry ................................................................................................................................. 21
  P.D. Paulson, S.H. Stephens, and W.N. Shafarman

Sub-Micron Optoelectronic Properties of Polycrystalline Solar Cell Materials .......................................................... 27
  S. Smith, R. Dhere, T. Gessert, P. Stradins, T. Wang, K. Ramanathan, R. Noufi, and A. Mascarenhas

Electron Radiation Damage in Cu(In,Ga)Se_{2} Analyzed In Situ by Cathodoluminescence in a Transmission Electron Microscope .......................................................................................... 33
  Hanne Scheel, Gerhard Frank, Niels Ott, Wolfram Witte, and Horst P. Strunk
ELECTRONIC STRUCTURE

* Synchrotron-Based Spectroscopy for the Characterization of Surfaces and Interfaces in Chalcopyrite Solar Cells ......................................................... 41
  Iver Lauermann, Paul Pistor, Immo Kotschau, and Marcus Bär

* Band Structure Investigation of Chalcopyrite CuInSe₂(001) by Angle-Resolved Photoelectron Spectroscopy .......................................................... 53
  Ralf Hunger and Christian Pettenkofer

DEFECTS AND IMPURITIES

A Comparison of In Situ As Doping With Ex Situ CdCl₂ Treatment of CdTe Solar Cells ................................................................................................. 67
  Vincent Barrioz, Rachael L. Rowlands, Eurig W. Jones, Stuart J.C. Irvine, Guillaume Zoppi, and Ken Durose

STRUCTURAL CHARACTERIZATION

* Glancing Incidence X-ray Diffraction of Polycrystalline Thin Films .......................................................................................................................... 75
  Brian E. McCandless

Cu K-Edge EXAFS Studies of CdCl₂ Effects on CdTe Solar Cells ............................................................................................................................. 87
  Xiangxin Liu, Alvin D. Compaan, and Jeff Terry

* Application of Advanced Microstructural and Microchemical Microscopy Techniques to Chalcopyrite Solar Cells ............................................. 93
  Changhui Lei, Chun-Ming Li, Angus Rockett, I.M. Robertson, and W. Shafarman

The Structure and Passivation Effects of Double-Positioning Twin Boundaries in CdTe .................................................................................................. 105
  Yanfa Yan, M.M. Al-Jassim, and K.M. Jones

*Invited Paper
POSTER SESSION I

Photovoltaic Effect in the Anisotype GaSe-InSe Heterojunctions Under Pressure.................................................................113
S.I. Drapak, M.O. Vorobets, and Z.D. Kovalyuk

Physical Vapor Deposition Synthesis of Cu3BiS3 for Application in Thin Film Photovoltaics..................................................119
Nathan J. Gerein and Joel A. Haber

Highly Mismatched Alloys for Intermediate Band Solar Cells.........................125
W. Walukiewicz, K.M. Yu, J. Wu, J.W. Ager III, W. Shan,
M.A. Scrapulla, O.D. Dubon, and P. Becla

TEM Studies of High-Efficiency CdTe Solar Cells on Commercial SnO2/Soda-Lime Glass ......................................................131
Yanfa Yan, X. Wu, J. Zhou, and M.M. Al-Jassim

Defects and Interfaces in Cu(In,Ga)Se2-Based Thin-Film Solar Cells With and Without Na Diffusion Barrier .........................137
Helge Heinrich, Sephalika Senapati, Shirpad R. Kulkarni,
Ankush R. Halbe, Dominik Rudmann, and Ayodhya N. Tiwari

Structural Properties of Ag-Based Chalcopyrite Compound Thin Films for Solar Cells.................................................................143
Hiroki Ishizaki, Keiichiro Yamada, Ryouta Arai,
Yasuyuki Kuromiya, Yukari Masatsugu,
Naoomi Yamada, and Tokio Nakada

Photostimulated Changes of Electrical Characteristics of Ag/CdTe Thin Film Structures.................................................................149
T.D. Dzhafarov and M. Caliskan

Band Alignment at CdS/Wide-Band-Gap Cu(In,Ga)Se2 Hetero-Junction by Using PES/IPES .................................................................155
S.H. Kong, H. Kashiwabara, K. Okhi, K. Itoh,
T. Okuda, S. Niki, K. Sakurai, A. Yamada,
S. Ishizuka, and N. Terada

Analysis of Proton Induced Defects in Cu(In,Ga)Se2 Thin-Film Solar Cells .................................................................161
Shirou Kawakita, Mitsuru Imaizumi, Koichi Kibe,
Shinichi Yoda, Takeshi Ohshima, Hisayoshi Itoh,
and Masafumi Yamaguchi
Built-In Potential and Open Circuit Voltage of Heterojunction CuIn$_{1-x}$Ga$_x$Se$_2$ Solar Cells

Akimasa Yamada, Koji Matsubara, Keiichiro Sakurai, Shogo Ishizuka, Hitoshi Tampo, Hajime Shibata, Tomoyuki Baba, Yasuyuki Kimura, Satoshi Nakamura, Hisayuki Nakanishi, and Shigeru Niki

Thin CuInS$_2$ Films Prepared by MOMBE: Interface and Surface Properties

C. Pettenkofer, C. Lehmann, and W. Calvet

Band Offsets at the ZnSe/CuInS$_2$ Interface

O. Papathanasiou, S. Siebentritt, I. Lauermann, T. Hahn, H. Metzner, and M.Ch. Lux-Steiner

The Optical Properties of the Interface Layer in CdS-CdTe Heterojunctions

Sergiu A. Vatavu

Nonequilibrium Charge Carrier Generation—Recombination Mechanisms in CdMnTe Thin Films

Iuliana M. Caraman, Sergiu A. Vatavu, Valentina Z. Nicorici, and Petru A. Gasin

Photoluminescence Studies on Cu and O Defects in Crystalline and Thin-Film CdTe

Caroline R. Corwine, Timothy A. Gessert, James R. Sites, Wyatt K. Metzger, Pat Dippo, Jingbo Li, Anna Duda, and Glenn Teeter

Photoluminescence From Ion Implanted CdTe Crystals

Xiangxin Liu and A.D. Compaan

Effects of Ge-Implantation on the Photoluminescence of CuGaSe$_2$ Thin Films

Serge Doka, Marin Rusu, Alex Meeder, Ernest Arushanov, Norbert Fabre, Sebastian Fiechter, Thomas Schedel-Niedrig, and Martha Ch. Lux-Steiner

CELLO Measurements of CIGS and μSi Solar Cells

Stefan Mathijssen, Jürgen Carstensen, Helmut Föll, Georg Voorwinden, and Helmut Stiebig

Conduction-Band-Offset Rule Governing J-V Distortion in CdS/CI(G)S Solar Cells

A. Kanevce, M. Gloeckler, A.O. Pudov, and J.R. Sites
Open-Circuit Voltage Decay in CdTe/CdS Solar Cells ...........................................227
  Kent Price, Kevin Cooper, and Chris Lacy

Complex Defect Behavior in Cu(In,Ga)Se₂ Solar Cells With Different Gallium Content ........................................................................231
  Verena Mertens, Jürgen Parisi, Robert Kniese,
  Marc Köntges, and Rolf Reincke-Koch

Investigating Minority-Carrier Traps in p-Type Cu(InGa)Se₂ Using Deep Level Transient Spectroscopy ..................................................237
  Steven W. Johnston, Jehad A.M. AbuShama, and Rommel Noufi

An Electron Paramagnetic Resonance and Photoelectron Spectroscopy Study on the Native Oxidation of CuGaSe₂ ........................................243
  R. Würz, A. Meeder, D. Fuertes-Marrón,
  Th. Schedel-Niedrig, and K. Lips

* Interfaces in CdTe Solar Cells: From Idealized Concepts to Technology ...............................................................251
  Wolfram Jaegermann, Andreas Klein, Jochen Fritsche,
  Daniel Kraft, and Bettina Späth

A Study of the Diffusion and pn-Junction Formation in CIGS Solar Cells Using EBIC and EDX Measurements ........................................265
  Shogo Ishizuka, Keiichiro Sakurai, Koji Matsubara,
  Akimasa Yamada, Minoru Yonemura, Shimpei Kuwamori,
  Satoshi Nakamura, Yasuyuki Kimura, Hisayuki Nakanishi,
  and Shigeru Niki

TCOs AND WINDOW LAYERS

Transparent Conducting Oxide Sculptured Thin Films for Photovoltaic Applications .................................................................273
  N.J. Podraza, Chi Chen, D. Sainju, O. Ezekoye, M.W. Horn,
  C.R. Wronski, and R.W. Collins

*Invited Paper
Design of a Window Layer for Flexible Cu(In,Ga)Se₂ Thin Film Solar Cell Devices .................................................. 279
Christian A. Kaufmann, Axel Neisser, Reiner Klenk, Roland Scheer, and Hans-Werner Schock

BACK CONTACTS

Dependence of the MoSe₂ Formation on the Mo Orientation and the Na Concentration for Cu(In,Ga)Se₂ Thin-Film Solar Cells ............................................................................... 287
Daniel Abou-Ras, Debashis Mukherji, Gernot Kostorz, David Brémaud, Marc Kälin, Dominik Rudmann, Max Döbeli, and Ayodhya N. Tiwari

Understanding Aniline Surface Treatment of CdTe ................................................................. 293
Kevin D. Dobson, Stephanie A. Einstein, Daniel D. Sadowsky, Brian E. McCandless, and Robert W. Birkmire

p-ZnTe for Back Contacts to CdTe Thin Film Solar Cells .................................................... 299
Bettina Späth, Jochen Fritzsche, Andreas Klein, and Wolfram Jaegermann

GRAIN BOUNDARIES AND INHOMOGENEITIES

* Physics of CdTe Photovoltaics: From Front to Back ......................................................... 307
V.G. Karpov, Diana Shvydka, and Yann Roussillon

Two-Dimensional and Multi-Experimental Modeling of Polycrystalline Cu(In,Ga)Se₂ Solar Cells ........................................................................................................... 319
W.K. Metzger, M. Gloeckler, and R.K. Ahrenkiel

PERFORMANCE OF SOLAR CELLS

* Novel Wide-Band-Gap Ag(InₓGa₁₋ₓ)Se₂ Thin Film Solar Cells ........................................ 327
Tokio Nakada, Keiichiro Yamada, Ryota Arai, Hiroki Ishizaki, and Naoomi Yamada

*Invited Paper
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Properties of Modified CuGaSe₂ Solar Cells</td>
<td>335</td>
</tr>
<tr>
<td>Jehad A. AbuShama, Steve W. Johnston,</td>
<td></td>
</tr>
<tr>
<td>David L. Young, and Rommel Noufi</td>
<td></td>
</tr>
<tr>
<td>Effect of Zn and Mg Doping on CuInS Thin Films and Solar Cells</td>
<td>341</td>
</tr>
<tr>
<td>Tobias Enzenhofer, Thomas Unold, Roland Scheer, and</td>
<td></td>
</tr>
<tr>
<td>Hans-Werner Schock</td>
<td></td>
</tr>
<tr>
<td>High-Efficiency CdTe Polycrystalline Thin-Film Solar Cells</td>
<td>347</td>
</tr>
<tr>
<td>Wu, J. Zhou, D. Duda, J.C. Keane, T.A. Gessert,</td>
<td></td>
</tr>
<tr>
<td>Y. Yan, and R. Noufi</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICAL CHARACTERIZATION</strong></td>
<td></td>
</tr>
<tr>
<td>Current Transients in CdS/CdTe Solar Cells</td>
<td>355</td>
</tr>
<tr>
<td>Alan Fahrenbruch</td>
<td></td>
</tr>
<tr>
<td>Spatial and Temporal Variations in Electronic Transport</td>
<td>361</td>
</tr>
<tr>
<td>Through a CdTe-Based Schottky Barrier</td>
<td></td>
</tr>
<tr>
<td>Diana Shvydka, V. Parikh, V.G. Karpov, and A.D. Compaan</td>
<td></td>
</tr>
<tr>
<td>Influence of Traps on Carrier Concentration Profiles</td>
<td>367</td>
</tr>
<tr>
<td>Measured by Capacitance-Voltage and Drive Level</td>
<td></td>
</tr>
<tr>
<td>Profiling in CIGSe-Based Heterojunctions</td>
<td></td>
</tr>
<tr>
<td>P. Zabierowski, M. Cwil, and M. Edoff</td>
<td></td>
</tr>
<tr>
<td>Detailed Study of Metastable Effects in the Cu(InGa)Se₂ Alloys</td>
<td>373</td>
</tr>
<tr>
<td>Test of Defect Creation Models</td>
<td></td>
</tr>
<tr>
<td>JinWoo Lee, Jennifer T. Heath, J. David Cohen, and</td>
<td></td>
</tr>
<tr>
<td>William N. Shafarman</td>
<td></td>
</tr>
<tr>
<td>POSTER SESSION II</td>
<td></td>
</tr>
<tr>
<td>Simulation of Polycrystalline Cu(In,Ga)Se₂ Solar Cells in Two</td>
<td>381</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Markus Gloeckler, Wyatt K. Metzger, and James R. Sites</td>
<td></td>
</tr>
<tr>
<td>Optimization of RF-Sputtered ITO Films for High NIR Transparency</td>
<td>387</td>
</tr>
<tr>
<td>at Low Deposition Temperature</td>
<td></td>
</tr>
<tr>
<td>J. Zhou, X. Wu, T.A. Gessert, Y. Yan, G. Teeter, and</td>
<td></td>
</tr>
<tr>
<td>H.R. Moutinho</td>
<td></td>
</tr>
</tbody>
</table>
Wide-Gap CIGS Solar Cells With Zn$_{1+y}$Mg$_y$O Transparent Conducting Film .......................................................... 393
K. Matsubara, A. Yamada, S. Ishizuka, K. Sakurai, H. Tampo,
Y. Kimura, S. Nakamura, M. Yonemura, H. Nakanishi, and
S. Niki

Structural, Optical and Electrical Properties of Transparent Conducting CuInO$_2$ Thin Films Prepared by RF Sputtering .................. 399
Bin Yang, Yunbin He, Angalika Polity, and Bruno K. Meyer

Transparent ZnTe:Cu Contacts for Bifacial Characterization of CdTe Solar Cells ......................................................... 405
Darshini Desai, Steven Hegedus, Brian McCandless, and
Daniel Ryan

Does CdTe Deposition Affect the Impurity Profile in Sputtered CdS Window Layers? ......................................................... 411
Mahieddine Emziane, Ken Durose, Douglas P. Halliday,
Alessio Bosio, and Nicola Romeo

Properties of Cu(In,Ga)Se$_2$:Fe Thin Films For Solar Cells ................................................................. 417
Keiichiro Sakurai, Hajime Shibata, Satoshi Nakamura,
Minoru Yonemura, Shinpei Kuwamori, Yasuyuki Kimura,
Shogo Ishizuka, Akimasa Yamada, Koji Matsubara,
Hisayuki Nakanishi, and Shigeru Niki

Effect of Stresses in Molybdenum Back Contact Film on Properties of CIGSS Absorber Layer .................................................. 423
Ankur A. Kadam, Anant H. Jahagirdar, and
Neelkanth G. Dhere

Growth Mechanisms of Electrodeposited CuInSe$_2$ and Cu(In,Ga)Se$_2$ Determined by Cyclic Voltammetry .................................................. 431
M. Estela Calixto, Kevin D. Dobson, Brian E. McCandless,
and Robert W. Birkmire

Performance of CuGaSe$_2$ Solar Cells Grown By Co-Evaporation Process ................................................................. 437
Jae Ho Yun, R.B.V. Chalapathy, Seok Ki Kim,
Jeong Chul Lee, Jinsoo Song, and Kyung Hoon Yoon

Solar Cells Prepared With Spray-ILGAR Indium Sulfide Buffer Layers on Cu(In,Ga)Se$_2$ Absorbers .................................................. 443
Nicholas A. Allsop, Christian A. Kaufmann,
Axel Neisser, Marin Rusu, Andreas Hänsel,
Martha C. Lux-Steiner, and Christian-H. Fischer
High-Efficient ZnO/PVD-CdS/Cu(In,Ga)Se₂ Thin Film Solar Cells: Formation of the Buffer-Absorber Interface and Transport Properties ........................................................................449
Marin Rusu, Thilo Glatzel, Christian A. Kaufmann, Axel Neisser, Susanne Siebentritt, Sascha Sadewasser, Thomas Schedel-Niedrig, and Martha Ch. Lux-Steiner

Formation and Characterization of the CuIn(S,Se)₂/Buffer Layer Interface in Electrodeposited Solar Cells .................................................................457
N. Naghavi, C. Hubert, O. Roussel, L. Sapin, M. Lamirand, J.F. Guillemoles, D. Lincot, J. Kessler, and O. Kerrec

Growth of CuInSe₂ Monograin Powders With Different Compositions ..........................................................................................................................463
Marit Kauk, Mare Altosaar, Jaan Raudoja, Kristi Timmo, Maarja Grossberg, Tiit Varema, and Enn Mellikov

Rapid Thermal Annealing on Cu(In,Ga)Se₂ Films and Solar Cells.................................................................................................................................471
Xuege Wang, Sheng S. Li, V. Craciun, S. Yoon, J.M. Howard, S. Easwaran, O. Manasreh, O.D. Crisalle, and T.J. Anderson

Large Area Cu(In,Ga)Se₂ Films and Devices on Flexible Substrates Made by Sputtering ..........................................................................................477
Dennis R. Hollars, Randy Dorn, P.D. Paulson, Jochen Titus, and Robert Zubeck

CdSe Thin Film Preparation by Unipolar Current Pulse Electrodeposition Technique ..................................................................................................483
Kiran Jain, N. Karar, and H. Chandra

SOLAR CELL TECHNOLOGY

Flexible, Monolithically Integrated Cu(In,Ga)Se₂ Thin-Film Solar Modules .............................................................................................................491
Dirk Herrmann, Friedrich Kessler, Ulf Klemm, Robert Kniese, Theresa Magorian Friedlmeier, Stefanie Spiering, Wolfram Witte, and Michael Powalla

* In Situ Sensors for CIGS Deposition and Manufacture .........................................................................................................................499
I.L. Repins, N. Gomez, L. Simpson, and B. Joshi

*Invited Paper
WIDE GAP CHALCOPYRITES

Band Gap and Interface Engineering of Wide Gap Cu-Containing Chalcopyrite Absorbers by Dry (In,Ga)-S Surface Treatments ............................................. 513
David Fuertes Marrón, Sebastian Lehmann,
Thomas Schedel-Niedrig, Joachim Klaer,
Reiner Klenk, and Martha Ch. Lux-Steiner

Characterization of the Electronic Properties of Wide Bandgap CuIn(SeS)2 Alloys .......................................................... 519
Adam F. Halverson, Peter T. Erslev, JinWoo Lee,
J. David Cohen, and William N. Shafarman

Band Gap Fluctuations in Cu(In,Ga)Se2 Thin Films ..................... 525
Julian Mattheis, Thomas Schlenker, Martin Bogicevic,
Uwe Rau, and Jürgen H. Werner

Optical, Structural and Electronic Properties of CuInS2 Solar Cells Deposited by Reactive Magnetron Sputtering ......................... 531
T. Unold, T. Enzenhofer, and K. Ellmer

Author Index ........................................................................................................ 537

Subject Index ........................................................................................................ 541
PREFACE

Thin-film photovoltaics have demonstrated efficiencies approaching 20% and are leading candidates to provide low cost renewable energy due to potential advantages in manufacturing and materials costs. Symposium F, “Thin-Film Compound Semiconductor Photovoltaics,” held March 29–April 1 at the 2005 MRS Spring Meeting in San Francisco, California, focused on chalcogenide semiconductors such as Cu(InGa)(SeS)₂, CdTe, and CdS, on transparent conducting oxides, and on photovoltaic devices using these materials. This volume contains papers presented at that symposium.

The symposium included three and a half days of oral sessions and two evening poster sessions, and this volume is organized according to the program sessions. The symposium included thirteen invited papers which reviewed critical areas of research on these materials and devices and present some particularly exciting new results. The application of recent advances in materials characterization to compound semiconductor thin films was a theme throughout the symposium. Particular highlights included results obtained with photoelectron spectroscopy, high resolution transmission electron microscopy, atomic probe techniques, and spectroscopic ellipsometry on these materials which provide new insights into surface, grain boundary and bulk properties. Several papers also presented results on new materials including different alloy s of CuInSe₂ and CdTe.

The symposium included two discussion sessions. The first was “Back contacts: Are they the key to improved Cu(InGa)Se₂ and CdTe solar cells?” There was general agreement that the contacts are controlled by interfacial layers but the effects on film growth and devices are still poorly understood. The second discussion was “Critical issues for thin film polycrystalline PV: What do we have and where are we going?” A lively session was dominated by efforts to define the relative value of fundamental and more applied research for helping a nascent PV industry.

A highlight of the symposium for many of its students and new researchers was the Young Scientist Tutorial on Characterization Techniques for Thin-Film Solar Cells with instructors D. Abou-Ras, X. Liu, J. Heath, and T. Rissom. This tutorial focused on fundamentals of characterization methods being utilized in the research and development of these materials and devices. A unique aspect of this tutorial was that it was presented by students and young researchers for students and young researchers to encourage an open atmosphere for discussions and scientific exchange.

The organizers would like to thank all of the attendees who made this symposium exciting and thought-provoking and also the authors whose contributions to this proceedings, we believe, will make it a valuable and lasting contribution to the field of thin-film photovoltaics. We would also like to thank the National Renewable Energy Laboratory, the Air Force Research Laboratory, DuPont Central Research and Development, and Shell Solar Industries for their generous support of the symposium.

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Shigeru Niki
Susanne Siebentritt
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