

Table of Contents

Preface

The Electrical Activity of Dislocations in Edge-Defined Film-Fed Growth Silicon	3
W.D. Sawyer, R.O. Bell and A. Schönecker	
Correlation of Structural and Electronic Properties from Dislocations in Semiconductors	13
J. Weber	
How Can Dislocations Enhance the Efficiency of Photovoltaic Solar Cells?	25
H.F. Mataré	
About the Electrical Conductivity of Dislocations in Multicrystalline Silicon Solar Cells	31
H. El Ghitani, M. Pasquinelli, J.J. Simon and S. Martinuzzi	
g-Tensors of Electrons Bound to 60°-Dislocations in Ge and Si	35
Y.T. Rebane and Y.G. Shreter	
Formation of Misfit Dislocation Networks in Ge/Si as Dependent on the Substrate Orientation	41
M. Albrecht, S. Christiansen, P.O. Hansson, H.P. Strunk and E. Bauser	
In Situ Observations of Dislocation Motion in Polycrystalline Silicon during Straining Experiment in a High-Voltage Electron Microscope	47
M. Werner, M. Bartsch, U. Messerschmidt and D. Baither	
Theoretical Study of the Atomic and Electronic Structures of Grain Boundaries in Semiconductors	55
M. Kohyama and R. Yamamoto	
Structure of Grain Boundaries in Polycrystalline Semiconductors	67
S. McKernan and C.B. Carter	
High Temperature Atomic Simulations of Grain Boundaries in Semiconductors Using a New Type of Periodic Boundary Conditions	75
O.B.M. Hardouin Duparc	
Calculation of the Free Energy of Different Configurations of {001}Σ=13 Grain Boundary in Silicon by the Quasiharmonic Method	85
B. Lebouvier, A. Hairie, F. Hairie, G. Nouet and E. Paumier	
Improved Quasiharmonic Methods for Grain Boundary Free Energy Calculations in Silicon	91
A. Hairie, F. Hairie, G. Nouet, E. Paumier and A.P. Sutton	
Calculation of Grain Boundary Free Energy by Molecular Dynamics and Tests on Silicon Perfect Crystal	97
N. Ralantoson, A. Hairie, F. Hairie, O.B.M. Hardouin Duparc, M. Hou, G. Nouet and E. Paumier	
Möbius Tight Binding Calculations for Grain Boundaries	103
O.B.M. Hardouin Duparc and M. Torrent	
Structural and Electrical Transport Properties of Grain Boundaries in High Temperature Superconductors	107
R. Gross	
The Microstructure of Sm_{2-x}Ce_xCuO_{4-δ}	119
S. Christiansen, J. Markl, A. Bram, H.P. Strunk, G. Saemann-Ischenko and H. Burzlaff	
Interaction of Grain Boundaries, Dislocations and Impurity Atoms in Semiconductors	125
K. Masuda-Jindo	
Oxygen and Copper Precipitation in the Vicinity of the Silicon-Silicon-Dioxide Interface: Microstructure and Electrical Properties	133
A. Correia, D. Ballutaud and J.L. Maurice	
Non-Ideal I-V-Characteristics of Block-Cast Silicon Solar Cells	139
O. Breitenstein and J. Heydenreich	
Copper and Nickel Precipitation in a Σ=25 Silicon Bicrystal	145
R. Rizk, X. Portier, G. Allais and G. Nouet	
Desorption Energy of Oxygen Adsorbed on Un-Intentionally Doped Low Pressure Chemical Vapor Deposited Silicon Films	151
D. Mostefa, B. Fortin, F. Raoult, M. Sarret, G. Rossé and O. Bonnaud	
Segregation and Precipitation of Platinum Silicides in Si/SiO₂ Interfaces and Dislocations	157
B. Laurent, D. Mangelinck, B. Pichaud, A. Lhorte and J.B. Quoirin	

Calculation of the Atomic and Electronic Structure of the {113} Planar Interstitial Defects in Silicon	163
M. Kohyama and S. Takeda	
Local Grain Boundary Property Measurements	171
D.B. Holt	
Local Investigation of the Electrical Properties of Grain Boundaries in Silicon	183
J. Palm, D. Steinbach and H. Alexander	
Investigation of Minority Carrier Diffusion Length in Multicrystalline Silicon by Quantitative Electron Beam Induced Current Mapping	189
A. Barhdadi, S. Sivoththaman, M. Barbe, M. Rodot and J.L. Maurice	
Minority Charge Carrier Trapping at Grain Boundaries Provided with a High Barrier Schottky Contact	195
C. Häßler, P. Bittner, G. Pensl and M. Schulz	
Electrical Transport in Polycrystalline Semiconductors	201
O. Ka	
Origin of Curved Arrhenius Plots for the Conductivity of Polycrystalline Semiconductors	213
J. Werner	
Effect of Local Inhomogeneities on the Electrical Properties of Polycrystalline Silicon	219
M. Acciarri, C. Savigni, S. Binetti and S. Pizzini	
On Some Photoelectrical Interface Processes in Mixed Semiconductor Heterostructures with Photosynthetic Pigment	225
M. Gherghel and I. Licea	
Polycrystalline Silicon-Silicon Carbide Emitters for Heterojunction Transistors	231
H.S. Gamble and G.A. Armstrong	
Investigation of the Defect Distribution in Polycrystalline Silicon	243
A. Zozime, O.F. Vyvenko, I. Hanke, W. Schröter, K. Ahlborn and K. Heisig	
Properties of Thermoluminescence and Thermally Stimulated Conductivity in Polycrystalline Materials: Numerical Studies	249
A. Mandowski and J. Swiatek	
Microscopic Processes in Crystallisation	257
J.L. Batstone and C. Hayzelden	
Laser Beam Application in Semiconductor Technology	269
T. Sameshima	
In-Situ Excimer Laser Induced Crystallization of Hydrogenated Amorphous Silicon Thin Films	281
N. Layadi, P. Roca i Cabarrocas, J. Huc, J.-. Parey and B. Dréville	
Microstructure of Poly-Si Obtained by Rapid Thermal Annealing of Amorphous Silicon Films	287
J. Stoemenos, N.A. Economou, L. Haji, M. Bonnel, N. Duhamel and B. Loisel	
Crystallisation Behaviour of Amorphous Thin Si Films Produced by Low Pressure Chemical Vapor Deposition	293
J.P. Guillemet, B. Pieraggi, B. Legros-de Mauduit and A. Claverie	
Beam Shape Effects with Excimer Laser Crystallisation of Plasma Enhanced and Low Pressure Chemical Vapor Deposited Amorphous Silicon	299
S.D. Brotherton, D.J. McCulloch and M.J. Edwards	
Crystalline and Electrical Properties of Polysilicon Obtained by Annealing of Si Films Produced by Low Pressure Chemical Vapor Deposition from Si_2H_6	305
E. Campo, J.P. Guillemet, J.J. Pedroviejo, B. Legros-de Mauduit and E. Scheid	
Determination of Crystallisation Parameters of a-Si from In Situ Conductance Measurements and Transmission Electron Microscopy Analysis	311
T. Kretz, R. Stroh, P. Legagneux, O. Huet, M. Magis and D. Pribat	
Grain Boundary Character Distribution in Rapidly Solidified and Annealed Silicon Ribbons	317
T. Watanabe, K.I. Arai, H. Terashima and H. Oikawa	
Decomposition and Microstructure during Crystallization of Amorphous $\text{Ge}_x\text{Si}_{1-x}$ Films	323
F. Edelman, Y. Komem, P. Werner, J. Heydenreich and S.S. Iyer	
A Comparison of Polysilicon Produced by Excimer (ArF) Laser Crystallisation and Low-Temperature (600°C) Furnace Crystallisation of Hydrogenated Amorphous Silicon (a-Si:H)	329
T.E. Dyer, J.M. Marshall, W. Pickin, A.R. Hepburn and J.F. Davies	

Microstructure and Transistor Properties of Solid-State-Crystallised Polysilicon: Effect of a Prolonged 600°C Anneal	335
J.L. Maurice, J. Dixmier, T. Kretz, P. Legagneux, F. Plais and D. Pribat	
The Art of Living with Defects in Silicon: Gettering and Passivation	343
R. Schindler	
Hydrogen and Deuterium in Semi-Crystalline Silicon Wafers and Solar Cells	
A.W. Weeber, H.H.C. de Moor, R.A. Steeman, W.C. Sinke, F. Schuurmans, P.-. Michiels, L.A. Verhoef, P.F.A. Alkemade and E. Algra	355
External Gettering around Extended Defects in Multicrystalline Silicon Wafers	
S. Martinuzzi, I. Perichad and M. Stemmer	361
Evidence for Defect Metastability in Hydrogen Passivated Fine Grain Polycrystalline Silicon	
N.H. Nickel, N.M. Johnson and W.B. Jackson	367
Deuterium Effusion from Microcrystalline Sputtered Silicon Thin Films: Hydrogen Stability and Bonding Configurations	
L. Lusson, P. Elkaim, A. Correia and D. Ballutaud	373
Defect Structure of Multicrystalline Chemical Vapor Deposited Silicon Films	
A. Voigt, B. Rillich and H.P. Strunk	381
Optical and Photoelectrical Properties of Microcrystalline Silicon Layers in Relation to Structural Ordering	
W. Henrion, R. Krakenhagen, M. Schmidt, I. Sieber and H. Flietner	387
Photo-Induced and Thermally Stimulated Degredation in a-Si:H : Mechanism of Defect Creation	
S.B. Aldabergenova, B.A. Andreev, K.V. Koughia and T.A. Sidorova	393
Electrical Properties and Microstructure of Metal Oxides Varistors	
N. Tabet, N. Boulares and C.J.A. Monty	399
General and Characteristic Features of the Structure of Polycrystalline and Non-Crystalline Silicon	
E.A. Svanbaev and T.I. Taurbaev	405
Properties of Anodically Oxidized Polycrystalline Silicon Layers	
S. Wagner, T. Otto and F. Bierau	411
Properties of Multicrystalline Silicon Heat Treated by Classical and Rapid Thermal Processing	
W. Warta, S.W. Glunz, A.B. Sproul, H. Lautenschlager, I. Reis and R. Schindler	415
A Contribution to the Characterization of Multicrystalline Solar Silicon	
E. Wolf, U. Geissler, D. Klinger and A. Voigt	421
Silicon Layers Grown by Liquid Phase Epitaxy on Polycrystalline Silicon Substrates	
G. Wagner and B. Steiner	427
Structural, Electrical and Optical Properties of Reactive Magnetron Sputtered Poly-crystalline ZnO: Al Films as a Function of the Oxygen Partial Pressure during Deposition	
K. Ellmer and R. Mientus	433
Photovoltaic Solar Cells: State of the Art, National Strategies and Perspectives	
A. Claverie	441
Poly-crystalline Silicon Films, New Candidates for Photovoltaics?	
S. Martinuzzi and J. Dugas	453
Poly-crystalline Silicon Thin Films on Glass for Photovoltaic Cell Applications	
Z. Shi and M.A. Green	459
Charge Build-Up in Solar Cells	
S. Mil'shtein, S. Iatrou, D. Kharas, R.O. Bell and D. Sandstrom	465
Three-dimensional Modelling of a Back Junction Solar Cell Made with Improved Poly-crystalline Silicon Wafers	
J. Dugas	471
MoS₂, MoSe₂, WS₂ and WSe₂ Thin Films for Photovoltaics	
A. Jäger-Waldau, M.C. Lux-Steiner and E. Bucher	479
Textured Thin Films of Transition Metal Dichalcogenides for Potential Application in Photoelectrochemical Solar Cells	
J. Pouzet and J.C. Bernede	485
Electrooptical and Structural Properties of Polycrystalline CdTe Thin Films for Solar Cells	
F.A. Abou-Elfotouh, L.L. Kazmerski, T. Wangenstein, S. Ashour and H.R. Moutinho	491

Growth Mechanism and Properties of Chemically Deposited Cadmium Sulfide Thin Films	497
R. Ortega-Borges, M. Froment, J. Vedel and D. Lincot	
Characterization of CuInSe₂ Absorber Thin Films Grown by Metal Organic Chemical Vapor Deposition	503
M.C. Artaud, F. Ouchen, S. Duchemin and J. Bougnat	
Physical Vapor Deposition of CuInX₂ (X = S, Se) Thin Films: A Model for the Growth Mechanism	509
R. Klenk, T. Walter, H.-. Schock and D. Cahen	
Effect of Annealing in a Selenium Atmosphere on the Properties of Flash Evaporated CuInSe₂ Polycrystalline Thin Films	515
S. Harsono, M. Lachab, A. Attia, F. Guastavino and D. Llinares	
Effect of Heat Treatment on Electrical Properties of Polycrystalline CuInSe₂ Thin Films Prepared by Two Methods	521
N. Agli, M. Abbaci, A. Maasmi, N. Benslim, L. Mahdjoubi, M. Pasquinelli and S. Martinuzzi	
Physical Properties of Electrodeposited Copper Indium Diselenide Thin Films and Junction Realization	527
L. Thouin, J.F. Guillemoles, S. Massaccesi, R. Ortega Borges, S. Sanchez, P. Cowache, D. Lincot and J. Vedel	
Polysilicon Technologies for Large Area Displays	535
N. Duhamel and B. Loisel	
Thermal Stability of Glass Substrates During Solid Phase Crystallisation of a-Si on Glass by Rapid Thermal Annealing	547
L. Plévert, L. Haji, M. Bonnel, N. Duhamel and B. Loisel	
Polycrystalline Silicon Thin Film Transistors for Liquid Crystal Displays	553
I.W. Wu	
Performance of Poly-Si Thin Film Transistors Fabricated by Excimer-Laser Annealing of SiH₄- and Si₂H₆- Source Low Pressure Vapor Deposited a-Si Films with or without Solid-Phase Crystallization	565
M. Fuse, I. Asai, M. Hirota and Y. Miyamoto	
Modelling and Optimisation of Poly-Si Thin Film Transistors for Flat Panel Displays	571
M. Kandouci and S. Mottet	
Bulk and Interface States in Polycrystalline Silicon Thin Film Transistors	577
C.A. Dimitriadis, D.H. Tassis, J. Stoemenos and N.A. Economou	
Hot Carrier Induced Degradation in Polycrystalline Silicon Thin Film Transistors	583
G. Fortunato, G. Tallarida and A. Pecora	
Influence of the Polysilicon Film Structure on the Capacitance Voltage Characteristics of Thin Film Transistors	589
Z. Benamara, S. Mansouri, H. Sehil, F. Raoult and O. Bonnaud	
Photoconductivity Peculiarities in CdSe Field Transistor Layer	595
J.V. Vaitkus, J. Capon, V. Kazukauskas, R. Kiliulis, J. Storasta, J. Vanfleteren and A. Zindulis	