

Table of Contents

Preface

Epitaxial Growth and Characterization of Nitride Semiconductors

A. Yoshida 1

Crystalline Bi₂Se₃ Thin Films: Growth and Properties

L.P. Deshmukh, D.S. Sutrave, K.M. Garadkar, G.S. Shahane and R.N. Mulik 7

Growth of High Purity GaAs Layers by Vapour Phase Epitaxy

K. Chand and R.K. Purohit 10

Amorphous Chalcogenide Semiconductors: The Role of Bismuth Addition

C. Vautier 14

Suppression of Auger Recombination by Strain in Sb Based mid-IR Lasers

B. Grietens, S.C. Jain, C. Van Hoof, S. Németh, P. Van Daele and G. Borghs 20

Study of Gate Length, Channel Length and Gate-Source Spacing on the GaAs MESFET Characteristics

N. Dasgupta and S. Murthy G.B 26

Physical Principles of New Devices Related to Giant Electric Field Effect in MDS Structure

M. Levin, V. Sandomirsky and I. Schlimak 29

Raman Spectroscopic Investigation of ZnO and Doped ZnO Films, Nanoparticles and Bulk Material at Ambient and High Pressures

S.K. Sharma and G.J. Exarhos 32

Microprocessing of Electronic Materials Using Short Wavelength Lasers

K. Sugioka and K. Toyoda 38

Band Gap Measurement of the Sintered Cd_xSe_{1-x} Films from Reflectance Measurement

S.K. Sharma, V. Kumar, S.K. Kaushish and T.P. Sharma 40

ZnTe Single Crystal Growth, Photoluminescence and Laser Ablation Studies

S. Bhunia and D.N. Bose 43

Photoluminescence Study of Hydrogen Passivation of ZnTe

S. Bhunia, D. Pal and D.N. Bose 47

Novel Lateral MOS Controlled Power Devices and Technologies for High Voltage Integrated Circuits

S.N. Ekkanath-Madathil, M.M.D. Souza and Z.X. Qin 51

Tin Oxide Gas Sensors

A. Balasubramanian 54

Structure and Composition of Pulsed Laser Deposited ZnSe Films

T. Ganguli, B.L. Dashora, P. Bhattacharya, L.M. Kukreja, P. Bhatnagar, H.S. Rawat, M. Lal and A. Gupta 59

The Phenomenology of Luminescence in Nanocrystalline Silicon

V.A. Singh and G.C. John 62

Studies on Electrical Properties of CdS_{1-x}Se_x Thin Films

L.P. Deshmukh, G.S. Shahane, D.S. Sutrave and P.P. Hankare 68

Development and Characterization of Porous Silicon (a Review)

R.M. Mehra, V. Agarwal and P.C. Mathur 71

Temperature-Dependent Behaviour of Chalcogenide Thin Film Contacts on Porous Silicon

S. Chakrabarti and S. Dhar 77

A Review on Template Synthesis: A Membrane Based Technology for Generation of Nano- / Micro-Materials

S.K. Chakarvarti and J. Vetter 80

Ion Channeling Studies in In_xGa_{1-x}As / GaAs

V. Harikumar, A.M. Siddiqui and A.P. Pathak 86

Electronic Properties Study of Carbon Nanostructure

S.V. Subramanyam, A. Sayeed, V. Meenakshi, D. Sutar and S. Bhattacharjee 89

Thermodynamic Equilibrium between Free Carriers and Excitons and Validity of Mass Action Law in GaAs Quantum Wells

R.J. Kumar, S.S. Prabhu and A. Vengurlekar 95

Annealing Behaviour of High Energy ^{120}Sn Implanted GaAs Y.P. Ali, V.P. Salvi, A.M. Narsale, B.M. Arora, D. Kanjilal and G.K. Mehta	98
Influence of Emitter-Base Junction Displacement on the Band Structure in Heterojunction Bipolar Transistors K.P. Kumar and A. DasGupta	101
Electrically Conducting Polymers: An Overview V.K. Sachdev, R.J. Kumar, A. Singh, S. Kumar and R.M. Mehra	104
Electronic Transport Properties of Mn-Doped $\alpha\text{-Se}_{80-x}\text{Te}_{20}\text{Zn}_x$ System R.S. Kundu, K.L. Bhatia, N. Kishore, M. Singh and P. Singh	110
A Comparative Study on Capacitance and Conductance-Voltage Response of Titanium Dioxide Based MOS Hydrogen Sensor D. Dwivedi, R. Dwivedi and S.K. Srivastava	113
A New Electrochemical Technique for Deposition of Quaternary Compound $\text{Cu}(\text{In}_y\text{Ga}_{1-y})\text{Se}_2$ Thin Films for Photovoltaic Applications S. Shanker and J.C. Garg	117
$\text{n-Cd}_{0.925}\text{Pb}_{0.075}\text{S:Sb}$ Photoelectrode / Electrolyte Solar Cells L.P. Deshmukh, B.M. More, K.M. Garadkar and G.S. Shahane	120
Role of Oxygen on Donor Formation in CZ-Silicon During 430-630 °C Heat Treatment O. Prakash and S. Singh	123
Photoinduced Metastabilities in Organopolysilane Films K. Shimakawa	131
Position of Dangling Bond States in Doped $\alpha\text{-Si:H}$ A.K. Sinha, S.K. Tripathi, G.S. Narayana and S.C. Agarwal	137
Potential Fluctuations and Staebler-Wronski Effect P. Agarwal and S.C. Agarwal	140
Energy Spectrum of Semiconductor Quantum Wells with Error Function Profile: Tunneling Resonance Calculation and Experiment S. Ghosh and B.M. Arora	143
Laser Induced Recrystallisation of Electrophoretically Deposited CdTe and CuInSe_2 Films P.C. Pande, S. Bocking, R.W. Miles, M.J. Carter and R. Hill	146
Field Effect Studies on MIS-Structure of P-Type CuInTe_2 Films Having Excess Cu and In M. Dashtiani, O.P. Sharma and B.R. Sethi	149
Direct Microfabrication of Chalcogenide Glasses by Light and Electron-Beam Exposures K. Tanaka and N. Yoshida	153
The Impurity Doping in Widegap Semiconductors T. Ido and H. Goto	159
Phonon Conductivity in Arsenic Doped Germanium at Low Temperature for Intermediate Donor Concentration M.K. Roy and B. Deb	164
Reactive Plasma Processes for the Fabrication of Nano-Dimensional Semiconductor Devices U.S. Tandon	167
Synthesis and Optical Characteristics of Solution Grown $\text{Hg}_x\text{Cd}_{1-x}\text{S}$ Thin Films L.P. Deshmukh, K.M. Garadkar, G.S. Shahane and P.P. Hankare	174
Magnetoresistance Measurements on Single Element Photoconductive $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$ Detectors D. Srinivasan, K. Sethupathi, V. Sankaranarayanan, G. Rangarajan, R. Ashokan, B.L. Sharma, H.S. Dewan and V. Gopal	177
Effect of Heavy Doping on Dark Conductivity of TBP Doped n-Type $\alpha\text{-Si:H}$ Films R.M. Mehra, I. Kaur and P.C. Mathur	180
Barrier Height of Ga-pSi(p) Schottky Diodes K.D. Patel, B.P. Modi and R. Srivastava	183
Sintered Ternary Films T.P. Sharma, S.K. Sharma, V. Kumar and V. Singh	186
High-Field Transport in Quantum-Well Nanostructures V.K. Arora	192
Electrical, Optical and Alloy Scattering Studies of MOCVD Grown $\text{In}_x\text{Ga}_{1-x}\text{As}$ Epitaxial Layers on GaAs Substrates R. Pal, L. Durai, T. Srinivasan, M. Singh, S.K. Agarwal and D.N. Bose	198

Semiconducting Polymers for Environment and Micro-Biological Detection S.C.K. Misra, A. Suri, S. Chandra, S.K. Srivastava and P. Tripathi	201
Electrical Properties of Zirconium Sulphoselenide Single Crystals S.G. Patel, M.K. Agarwal, S.K. Arora and S. Goyal	204
Properties of Bismuth Molybdate as Ethanol Sensor Semiconductor Material K. Jain and A.C. Rastogi	212
Composition of $(\text{Bi}_2\text{S}_3)_{1-x}(\text{CdS})_x$ Semiconductor Thin Films by Proton Induced X-Ray Emission and Helium Backscattering S. Misra	215
Study of Mg Associated Levels in GaN M.R.H. Khan, T. Detchprohm, H. Nakayama, K. Hiramatsu and N. Sawaki	218
Optical Properties of $a\text{-Se}_{80-x}\text{Te}_x\text{Ga}_{20}$ Thin Films Z.H. Khan, M. Ilyas, M. Zulfequar and M. Husain	222
Electrical, Optical and Structural Properties of Copper Aluminium diSelenide Thin Films C.M. Joseph and C.S. Menon	226
Fabrication of a New Basic Structure $(\text{Al-Ga}_2\text{Se}_3\text{Si})$ for Photovoltaic Application M. Bhatnagar, P. Pathak and P.K. Bhatnagar	230
Prediction of Structural Units in Amorphous $\text{Ga}_{(1-x)}\text{Se}_x$ P.K. Gupta, K. Bhardwaj and P.K. Bhatnagar	233