

Table of Contents

Preface

Chapter 1: Optical and Electronic Materials

Electronic Structure and Optical Properties of Strained Type-II InAs_xSb_{1-x}/InAs Quantum Dots for Mid-Infrared Applications	
G.H. Yeap, S. Rybchenko, I. Itskevich, S. Haywood, P. Carrington and A. Krier	3
X-Rays Diffraction Study of InGaN/GaN Heterostructures Grown by MOCVD Technique at Different Temperatures	
A.K. Tan, N.A. Hamzah and S.S. Ng	9
Effect of Mn Incorporated into LiNbO₃ Crystal Structure on the Electronic and Optical Properties Using First-Principles Study	
L.W. Zainuddin, M.H. Samat, F.W. Badrudin, O.H. Hassan and M.F.M. Taib	15
Characterization of Nanocrystalline SnO₂-Y₂O₃ Thin Films Prepared Using Chemical Bath Deposition	
I.H. Kadhim and H. Nagem Abd	21
Indium Doped ZnO Thin Film Using Spin Coating for TCO Application	
S.S. Shariffudin, A.H. Mohd Zaid, N.E.A. Azhar, P.S.M. Saad, H. Hashim and M.H. Mamat	27

Chapter 2: Inspection and Analysis Defects in Silicon Carbide-Based Structures

Charge State Control over Point Defects in Sic Devices	
M.E. Bathen, G.M. Selnesaunet, M.J. Enga, S.B. Kjeldby, J. Müting, L. Vines and U. Grossner	35
Investigation of Defect Generation and Propagation in Electrically and Photonically Stressed Silicon Carbide	
H.Y. Peng, Y.F. Liu, Z.Y. Chen, Q.Y. Cheng, S.S. Hu, J. Watson, K. Sampayan, S. Sampayan, B. Raghethamachar and M. Dudley	43
Basal Plane Dislocation Slip Band Characterization and Epitaxial Propagation in 4H SiC	
G. Chung, R. Viveros, C. Lee, A. Soukhojak, V. Pushkarev, Q.Y. Cheng, B. Raghethamachar and M. Dudley	51
High Sensitivity Surface Defect Inspection of SiC and SmartSiCTM Substrates Using a DUV Laser-Based System	
E. Cela, S. Shahidi, P. Parangi, R. Shrestha, G. Simpson, J. Widiez, N. Daval, A. Chapelle, S. Rouchier and W. Schwarzenbach	57
Study of Defects in 4H-SiC Epitaxy at Various Buffer Layer Growth Conditions	
T. Rana, J. Wu, G. Chung, K. Moeggenborg and M. Gave	63
S-EVC Method for Sorting Wafers with Defects that Extend to Bar Shaped SSFs	
K. Takano, Y. Matsushita and Y. Igarashi	69
The Development of the Advanced Inspection System to Screen out the BPDs that Extend to Bar Shaped SSFs under Forward Biasing	
Y. Igarashi, K. Takano, Y. Matsushita and C. Shibata	75

Chapter 3: Chemical Synthesis and Treatment of Materials

Microstructure Investigation of Activated Carbon Prepared by Carbon Dioxide-Physical Activation	
A.M. Jasim and N. Abbas Ali	85
Preparation and Characterization of Nano Membrane for Fuel Cell	
M.N. Mahdi, M.K. Ibrahim and H.J. Mohammed	99

Chapter 4: Waste Conversion Technologies

Investigating the Performance of Single Chamber Microbial Fuel Cell (SCMFC) as Sustainable- Innovative Technique for Electricity Generation and Wastewater Treatment
M.Y. Adnan and A. Hassoon Ali

107

Estimation of Capacity of Municipal Solid Waste - Based Power Generation Plant in Iraq
A.R. Othman, T.L. Saleem, S.S. Salman and Y.A. Kahtan

119