

Table of Contents

Preface

Chapter 1: Properties of Silicon Carbide Semiconductor Materials

Temperature Dependent Electrical Properties of N-Type 4H-SiC Substrates	
D.J. Lichtenwalner, J.H. Park, S. Rogers, H. Dixit, A. Scholtze, S. Bubel and S.H. Ryu	3
Controlled Macrostepping of Si-Face 4°off 4H-SiC over a Large Area via Liquid Si-Induced Reconstruction	
Y. Joussemae, F. Cauwet, J. Woerle, U. Grossner, S. Aslanidou, G. Rius, P. Godignon and G. Ferro	9
Evaluation of Hysteresis Response in Achiral Edges of Graphene Nanoribbons on Semi-Insulating SiC	
S. Mathew, S. Abedin, V. Kurtash, S.P. Lebedev, A.A. Lebedev, B. Hähnlein, J. Stauffenberg, H.O. Jacobs and J. Pezoldt	15
Quantification of Secondary Electron Doping Contrast in the Scanning Electron Microscope on 4H-SiC	
M. Moser, G. Pobegen and J. Smoliner	23
PL Signatures from Decoration of Dislocations in SiC Substrates and Epitaxial Wafers	
G. Chung, C. Lee, A. Soukhojak and T. Rana	31
Light Extraction from 4H Silicon Carbide by Nanostructuring the Surface with High Temperature Annealing	
E. Vuillermet, E. Usureau, M. Lazar and R. Deturche	37
Characterization of Prismatic Slip in SiC Crystals by Chemical Etching Method	
S.S. Hu, S. Fang, Y.F. Liu, Q.Y. Cheng, H.Y. Peng, Z.Y. Chen, Y.H. Gao, C. Gao, B. Raghothamachar and M. Dudley	45
Recent Progress in Non-Contact Electrical Characterization for SiC and Related Compounds	
A. Savchouk, M. Wilson, D. Marinskiy, B. Schrayer, C. Almeida and J. Lagowski	51
Correlation between Q-Factor and Residual Stress in Epitaxial 3C-SiC Double-Clamped Beam Resonators	
S. Sapienza, M. Ferri, L. Belsito, D. Marini, M. Zielinski, F. La Via and A. Roncaglia	57
Selective Oxidation during AFM Electrical Characterization of Doped SiC Layers	
R.C. Germanicus, A. Boumaarouf, C. Villeneuve-Faure, V.A. Shah, P.M. Gammon and U. Lüders	63
Evaluation of Crystal Quality and Dopant Activation of Smart CutTM - Transferred 4H-SiC Thin Film	
G. Gelineau, J. Widiez, E. Rolland, K. Vladimirova, A. Moulin, V. Prudkovskiy, N. Troutot, P. Gergaud, D. Mariolle, S. Barbet, V. Amalbert, G. Lapertot, K. Mony, S. Rouchier, R. Boulet, G. Berre, W. Schwarzenbach and Y. Bogumilowicz	71
Accurate Determination of the Temperature Dependence of the Refractive Index of 4H-SiC at the Wavelength of 632 nm	
E.D. Mallemace, S. Rao, M. Casalino, M. Iodice, G. Faggio, G. Messina and F.G. Della Corte	81

Chapter 2: Steel and Alloys

Effect of Varying Beryllium Addition on Microstructure, and Corrosion Behaviors of Cu-Zn-Al Shape Memory Alloys	
N.M. Dawood and A.M. Salim	89
The Effect of Heat Treatment on Wear Properties of Ni-B-CNT Electroless Coating with Different Carbon Nanotube Concentration on AISI 4340 Steel	
A.M.H. Wais and A.R. Abid Ali	97
Effect of Si Content on Microstructure and Mechanical Behavior of Porous Ti-22 at% Nb Shape Memory Alloys for Biomedical Applications	
S. Jasim, Z. Hussien Khalaf and N.M. Dawood	109

Chapter 3: Advanced Building Materials

Dry Mix for Facade Self-Cleaning Silicate Paint

G.I. Yakovlev, Z. Saidova, I. Ginchitskaia, N. Kuzmina, D. Trofimova, A.F. Buryanov and A.E.M.M. Elrefaei

123

Efficiency of Bacteria-Based Self-Healing Mechanism in Concrete

S. Shaaban, N. Hammad, A. Elnemr and I.G. Shaaban

135

Properties of Cement-Based Composites Modified with Metal/Carbon Nanocomposite

S.N. Semyonova, G.I. Yakovlev, I.S. Polyanskikh, A.F. Buryanov and A.V. Shaybadullina

145

Influence of Silica Nanoparticles on the Properties of Nanocomposite Based on Epoxy as Concrete Protective Coating

M.A. Shohide and M.A. Ahmed

153

Recent Progress in Limestone-Calcined Clay Cement (LC3): A Review

G.E. Abdelaziz, H. Shoukry, A.A. Selim and M.S. Saif

165

Impact of Accelerated Weathering on Fire Resistance Performance of Intumescent Materials

A. Zaki, R.M. Elkady, T.M. Khalaf, M.A. Elkady and S. Shebl

175