

## CONTENTS

CONTRIBUTORS TO VOLUME 58 . . . . .	vii
PUBLISHER'S FOREWORD . . . . .	ix
FOREWORD . . . . .	xi

### Modeling of Irradiation-Induced Changes in the Electrical Properties of Metal-Oxide-Semiconductor Structures

J. N. CHURCHILL, F. E. HOLMSTROM, AND T. W. COLLINS

I. Brief History and Introduction . . . . .	1
II. Modeling Considerations . . . . .	12
III. General Relationships between $V_{fb}$ and $V_{gr}(D)$ . . . . .	22
IV. Simple Descriptive Models . . . . .	41
V. Complete Computer Simulation . . . . .	53
VI. Discussion . . . . .	72
Nomenclature . . . . .	75
References . . . . .	76

### Point Defects in GaP, GaAs, and InP

U. KAUFMANN AND J. SCHNEIDER

I. Introduction . . . . .	81
II. Experimental Techniques for Point Defect Assessment . . . . .	84
III. Donors and Acceptors . . . . .	86
IV. Intrinsic Defects . . . . .	96
V. 3d Transition Metals . . . . .	109
References . . . . .	135

### Collisional Detachment of Negative Ions

R. L. CHAMPION

I. Introduction . . . . .	143
II. Nomenclature and Experimental Techniques . . . . .	146
III. Atomic Reactants . . . . .	148
IV. Molecular Reactants . . . . .	177
V. Summary . . . . .	186
References . . . . .	187

**Ion Implantation for Very Large Scale Integration**

HEINER RYSEL

1. Introduction . . . . .	191
2. Range Distributions of Implanted Ions . . . . .	193
3. Annealing of Implanted Layers . . . . .	210
4. Nondoping and Other New Applications of Implantation . . . . .	231
5. Application of Implantation to Devices . . . . .	251
6. Conclusions . . . . .	265
References . . . . .	266

**Stimulated Čerenkov Radiation**

JOHN E. WALSH

I. Introduction . . . . .	271
II. Theory . . . . .	275
III. Experiment . . . . .	301
IV. Conclusion . . . . .	309
References . . . . .	310

**Materials Considerations for Advances in Submicron Very Large Scale Integration**

D. K. FERRY

I. Introduction . . . . .	312
II. Submicron MOSFETs . . . . .	314
III. Submicron MESFETs . . . . .	332
IV. Switching of High-Speed Logic . . . . .	340
V. Band Structure Considerations . . . . .	361
VI. Comparisons and Limitations of Logic for Ultra-Large-Scale Integration . . . . .	375
References . . . . .	387

AUTHOR INDEX . . . . .	391
SUBJECT INDEX . . . . .	405