Record Nr. UNINA9910829886503321

Autore Kolobov Alexander V

Titolo Photo-induced metastability in amorphous semiconductors [[electronic

resource] /] / [edited by] Alexander V. Kolobov; with a foreword of

Kazunobu Tanaka

Pubbl/distr/stampa Weinheim, : [Cambridge], : Wiley-VCH, c2003

ISBN 1-280-72298-3

9786610722983 3-527-60254-2 3-527-60866-4

Descrizione fisica 1 online resource (438 p.)

Altri autori (Persone) KolobovAlexander V

Disciplina 541.22

621.38152

Soggetti Amorphous semiconductors

Chemical structure

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Note generali Description based upon print version of record.

Nota di contenuto Photo-Induced Metastability in Amorphous Semiconductors; Preface:

Introduction; Contents; List of Contributors; 1 Structure, Defects and Electronic Properties of Amorphous Semiconductors; 1.1 Structural States of Solids; 1.1.1 Ordered State; 1.1.2 Disordered (Non-

Crystalline) State; 1.2 Atomic Scale Ordering in Crystalline and Non-Crystalline Solids; 1.2.1 Long-Range Order; 1.2.2 Short-Range Order; 1.2.3 Medium-Range Order; 1.3 Fundamental Problems of Structure of

Non-Crystalline Semiconductors; 1.3.1 Tetrahedrally Bonded

**Amorphous Semiconductors** 

1.3.2 Amorphous Non-Tetrahedrally Bonded Semiconductors1.4
Defects in Non-Crystalline Solids; 1.4.1 Local Defects; 1.4.2 The
Diffuse or Collective Defects (Extended Defects); 1.4.3 Chemical
Defects; 1.4.4 Electronic-Structural Defects; 1.4.5 Macrodefects; 1.5
Electronic States in Amorphous Semiconductors; 1.5.1 Electronic States
in Tetrahedrally Bonded Semiconductors; 1.5.2 Electronic States in
Non-Tetrahedrally Bonded Semiconductors; References; 2 PhotoInduced Phenomena in Amorphous and Glassy Chalcogenides; 2.1

Introduction; 2.2 Photo-Induced Effects in Amorphous and Glassy Chalcogenides

2.2.1 Irreversible Photo-Induced Changes 2.2.2 Reversible Photo-Induced Changes; 2.3 Applications; 2.4 Summary; References; 3 Short-, Medium- and Long-Range-Order Structural Transformations in Amorphous Semiconductors; 3.1 Introduction; 3.2 Short-Range-Order (SRO) Effects; 3.3 Medium-Range-Order (MRO) Effects; 3.4 Long-Range-Order (LRO) Effects; 3.5 Conclusion; References; 4 Dynamics of Photo-Induced Metastability in Amorphous Chalcogenides: 4.1 Introduction: 4.2 Light-Induced Metastable Defect (LIMD) Creation: 4.3 Photostructural Changes; 4.4 Discussion; 4.5 Conclusions; References 5 Sub-Gap Photo-Induced Phenomena in Chalcogenide Glasses 5.1 Introduction: 5.2 Chalcogenide Glass: 5.3 Photo-Induced Phenomena: 5.4 Sub-Gap Photo-Induced Phenomena; 5.4.1 Background; 5.4.2 Photo-Induced Bragg Grating: 5.4.3 Photo-Induced Persistent Self-Focusing Structure: 5.4.4 Photo-Induced Fluidity: 5.4.5 Giant Photoexpansion; 5.4.6 Spectral Light-Intensity Dependence; 5.5 Mechanism: 5.5.1 Temperature Rise: 5.5.2 Two-Photon Absorption: 5.5.3 Gap States and Microscopic Structure; 5.5.4 Refractive-Index Change; 5.5.5 Fluidity and Volume Expansion; 5.6 Summary; References

6 Photo-Induced Anisotropy in Chalcogenide Glassy Semiconductors6.1 Introduction; 6.2 Samples and Experimental Procedures; 6.3 Photo-Induced Optical Anisotropy; 6.3.1 Above-Bandgap Light Excitation; 6.3.2 Sub-Bandgap Light Excitation; 6.3.3 Super-Bandgap Light Excitation; 6.4 Photo-Induced Anisotropy of Other Properties of ChGS; 6.4.1 Polarization-Dependent Photocrystallization; 6.4.2 Polarization-Dependent Photocoping of ChGS Films by Silver; 6.4.3 Photo-Induced Anisotropy of Photoconductivity; 6.4.4 Anisotropic Opto-Mechanical Effect and Ionic Transport; 6.5 Conclusion; References 7 The Optomechanical Effect in Amorphous Chalcogenide Films

## Sommario/riassunto

A review summarising the current state of research in the field, bridging the gaps in the existing literature. All the chapters are written by world leaders in research and development and guide readers through the details of photo-induced metastability and the results of the latest experiments and simulations not found in standard monographs on this topic. A useful reference not only for graduates but also for scientific and industrial researchers. With a foreword of Kazunobu Tanaka.