

1. Record Nr.	UNINA9910829932303321
Titolo	Bulk crystal growth of electronic, optical & optoelectronic materials [[electronic resource] /] / edited by Peter Capper
Pubbl/distr/stampa	Chichester ; ; Hoboken, NJ, : John Wiley & Sons, c2005
ISBN	1-280-24169-1 9786610241699 0-470-01208-0 0-470-01207-2
Descrizione fisica	1 online resource (579 p.)
Collana	Wiley series in materials for electronic and optoelectronic applications
Classificazione	51.12
Altri autori (Persone)	CapperPeter
Disciplina	621.38152
Soggetti	Semiconductors - Materials Optoelectronics - Materials Crystal growth
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents; Series Preface; Preface; Acknowledgements; List of Contributors; Abbreviations; 1 Silicon; 1.1 Introduction; 1.2 Crystal-growth method and technology; 1.2.1 High-purity polycrystalline silicon; 1.2.2 CZ-Si growth apparatus and related furnace parts; 1.2.3 CZ-Si crystal growth; 1.2.4 FZ (float-zone) Si crystal growth; 1.2.5 Wafer processing; 1.3 Melt process; 1.3.1 Analysis of heat- and mass-transfer processes; 1.3.2 Oxygen transportation process and mechanism; 1.3.3 Control of oxygen concentration by application of cusp magnetic field; 1.4 Defect and wafer quality 1.4.1 Oxygen precipitation and gettering 1.4.2 Grown-in defects; 1.5 Concluding remarks; References; 2 Growth of Gallium Arsenide; 2.1 Introduction; 2.2 Doping considerations; 2.3 Growth techniques; 2.3.1 Horizontal Bridgman and horizontal gradient freeze techniques; 2.3.2 Liquid encapsulated Czochralski (LEC) technique; 2.3.3 Vertical gradient freeze (VGF) technique; 2.4 Crystalline defects in GaAs; 2.4.1 Defects in melt-grown, semi-insulating GaAs; 2.5 Impurity and defect analysis of GaAs (chemical); 2.6 Impurity and defect analysis of GaAs (electrical) 2.6.1 Introduction to the electrical analysis of defects in GaAs 2.7

Impurity and defect analysis of GaAs (optical); 2.7.1 Optical analysis of defects in GaAs; 2.8 Conclusions; Acknowledgments; References; 3 Computer Modelling of Bulk Crystal Growth; 3.1 Introduction; 3.2 Present state of bulk crystal growth modelling; 3.3 Bulk crystal growth processes; 3.4 Transport modelling in bulk crystal growth; 3.4.1 Governing equations; 3.4.2 Boundary conditions; 3.4.3 Continuum interface representation; 3.4.4 Radiation heat-transfer modelling; 3.4.5 Noninertial reference frames; 3.4.6 Magnetic fields
3.4.7 Turbulence
3.5 Computer-aided analysis; 3.5.1 Discretization; 3.5.2 Numerical interface representation; 3.5.3 Deforming grids and ALE methods; 3.5.4 A simple fixed-grid method; 3.5.5 Quasi-steady-state models; 3.6 Modelling examples; 3.6.1 Float-zone refinement of silicon sheets; 3.6.2 Bridgman growth of CZT: axisymmetric analysis; 3.6.3 Bridgman growth of CZT: three-dimensional analysis; 3.6.4 Morphological stability in solution growth of KTP; 3.7 Summary and outlook; Acknowledgments; References; 4 Indium Phosphide Crystal Growth; 4.1 Introduction; 4.2 Material properties; 4.3 Hazards
4.4 Crystal structure
4.5 Synthesis; 4.6 Single-crystal growth; 4.7 Defects; 4.7.1 Twins; 4.7.2 Dislocations; 4.8 Dislocation reduction; 4.9 VGF growth; 4.10 Crystal-growth modelling; 4.11 Dopants; 4.11.1 N-type InP; 4.11.2 P-type InP; 4.11.3 Semi-insulating InP; 4.12 Conclusion; Acknowledgements; References; 5 Bulk Growth of InSb and Related Ternary Alloys; 5.1 Introduction-a little history; 5.2 Why the interest?; 5.3 Key properties; 5.3.1 Crystallography; 5.3.2 Growth-critical material parameters; 5.3.3 Common growth conditions; 5.3.4 Impurities and dopants; 5.4 Czochralski growth
5.4.1 Challenges

Sommario/riassunto

A valuable, timely book for the crystal growth community, edited by one of the most respected members in the field. Contents cover all the important materials from silicon through the III-V and II-IV compounds to oxides, nitrides, fluorides, carbides and diamonds. International group of contributors from academia and industry provide a balanced treatment. Includes global interest with particular relevance to: USA, Canada, UK, France, Germany, Netherlands, Belgium, Italy, Spain, Switzerland, Japan, Korea, Taiwan, China, Australia and South Africa.
