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Nota di contenuto	Crystal Growth Technology; Contents; Preface; List of Contributors; Part I General Aspects of Crystal Growth Technology; 1 Phase Diagrams for Crystal Growth; 1.1 Introduction; 1.2 Thermodynamics and Phase Diagrams; 1.3 Phase Diagrams vs. Crystal Growth from Liquid Phases; 1.4 Conclusions; References; 2 Fundamentals of Equilibrium Thermodynamics of Crystal Growth; 2.1 Introduction; 2.2 Recapitulation of Some Basic Concepts; 2.3 Relationships Between Thermodynamics and Kinetics; 2.4 Thermodynamics of Melt Growth; 2.5 Thermodynamics of Solution Growth 2.6 Thermodynamics of Crystal Growth from the Vapor 2.7 Solid-Solid Equilibria; 2.8 Thermodynamics of Nucleation and Interfaces; 2.9 Summary; References; 3 Thermodynamics, Origin, and Control of Defects; 3.1 Introduction; 3.2 Native Point Defects; 3.3 Dislocations; 3.4 Dislocation Cells and Grain Boundaries; 3.5 Second-Phase Particles; 3.6 Summary and Outlook; References; 4 Thermophysical Properties of Molten Silicon; 4.1 Introduction; 4.2 Density and Volumetric Thermal

Expansion Coefficient; 4.3 Isobaric Molar Heat Capacity; 4.4 Emissivity; 4.5 Thermal Conductivity; 4.6 Surface Tension 4.7 Diffusion Constant 4.8 Viscosity; 4.9 Electrical Conductivity; 4.10 Sensitivity Analysis; 4.11 Recommended Thermophysical Property Data for Silicon System; 4.12 Summary; References; Part II Simulation of Industrial Growth Processes; 5 Yield Improvement and Defect Control in Bridgman-Type Crystal Growth with the Aid of Thermal Modeling; 5.1 Introduction; 5.2 Principles of Thermal Modeling; 5.3 Verification of Numerical Models; 5.4 Yield Enhancement by Defect Control; 5.5 Conclusions; References; 6 Modeling of Czochralski Growth of Large Silicon Crystals; 6.1 Introduction 6.2 Numerical Model 6.3 Model Validation; 6.4 Conclusions; References; 7 Global Analysis of Effects of Magnetic Field Configuration on Melt/Crystal Interface Shape and Melt Flow in a Cz-Si Crystal Growth; 7.1 Introduction; 7.2 Model Description and Governing Equations Under a Transverse Magnetic Field; 7.3 Computation Results for Model Validation; 7.4 Numerical Analysis of a TMCZ Growth; 7.5 Conclusions; References; 8 Modeling of Semitransparent Bulk Crystal Growth; 8.1 Introduction; 8.2 Numerical Model; 8.3 An Example: Growth of Bismuth Germanate Crystals; 8.4 Conclusions; References Part III Compound Semiconductors 9 Recent Progress in GaAs Growth Technologies at FREIBERGER; 9.1 Introduction; 9.2 Properties of GaAs; 9.3 Growth of Large-Diameter GaAs Single Crystals; 9.4 LEC versus VB/VGF GaAs Wafers; 9.5 Doping; 9.6 Summary; References; 10 Interface Stability and Its Impact on Control Dynamics; 10.1 Introduction; 10.2 Diameter Control; 10.3 Interface Transitions; 10.4 Factors Influencing the Shape of the Solid/Liquid Interface; 10.5 Conclusions and Discussion; References 11 Use of Forced Mixing via the Accelerated Crucible Rotation Technique (ACRT) in Bridgman Growth of Cadmium Mercury Telluride (CMT)

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## Sommario/riassunto

Capturing the essence of current trends, markets, design tools and technologies in this key field, the internationally acclaimed expert editors have put together a handy reference tailor-made for readers facing the threshold challenges between research and industrial applications. Following a look at general aspects, the book goes on to discuss simulation of industrial growth processes, compound semiconductors, scintillator crystals, oxides, and crystal machining, as well as the potential of crystal growth for sustaining energy and aspects of world crystal production. With many figures,

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