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Autore	Sangwal Keshra
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Nota di contenuto	Additives and Crystallization Processes; Contents; Preface; 1 Complexes in Solutions; 1.1 Structure of Common Solvents; 1.2 Structure of Pure Aqueous Electrolyte Solutions; 1.2.1 Solvation of Electrolyte Ions in Solutions; 1.2.2 Concentrated and Saturated Electrolyte Solutions; 1.2.3 Formation of Aquo and Partially Aquo Complexes; 1.3 Structure of Aqueous Electrolyte Solutions Containing Additives; 1.4 Polyelectrolytes and Surfactants in Solutions; 1.5 Polydentate Ligands and Molecular Additives; 1.6 Crystal-Additive Interactions; References 2 Three-Dimensional Nucleation and Metastable Zone Width2.1 Driving Force for Phase Transition; 2.2 Three-Dimensional Nucleation of Crystals; 2.2.1 Three-Dimensional Nucleation Rate; 2.2.2 Three-Dimensional Heterogeneous Nucleation; 2.3 Metastable Zone Width; 2.4 Nucleation and Transformation of Metastable Phases; 2.4.1

Crystallization of Metastable Phases; 2.4.2 Overall Crystallization; 2.5 Induction Period for Crystallization; 2.6 Effects of Additives; 2.6.1 Solubility; 2.6.2 Three-Dimensional Nucleation Rate; 2.6.3 Metastable Zone Width; References
3 Kinetics and Mechanism of Crystal Growth: An Overview3.1 Crystal Growth as a Kinetic Process; 3.2 Types of Crystal-Medium Interfaces; 3.3 Roughening of Steps and Surfaces; 3.3.1 Thermodynamic Roughening and the Surface Entropy Factor; 3.3.2 Kinetic Roughening; 3.4 Growth Kinetics of Rough Faces; 3.5 Growth Kinetics of Perfect Smooth Faces; 3.6 Growth Kinetics of Imperfect Smooth Faces; 3.6.1 Surface Diffusion and Direct Integration Models; 3.6.2 Bulk Diffusion Models; 3.6.3 Growth by a Group of Cooperating Screw Dislocations; 3.6.4 Preferential Growth at Edge Dislocations
3.7 Effect of Foreign Substances on Growth Kinetics3.7.1 Some General Considerations; 3.7.2 Growth Kinetics by Heterogeneous Two-Dimensional Nucleation; 3.8 Real Crystal Growth Mechanisms; 3.8.1 Structure of Interfacial Layer; 3.8.2 Sources of Growth Steps; 3.9 Techniques for Studying Growth Kinetics; References; 4 Effect of Impurities on Crystal Growth Kinetics; 4.1 Mobile and Immobile Impurities; 4.2 Surface Coverage and Adsorption Isotherms; 4.2.1 Adsorption Isotherms; 4.2.2 Changes in Surface Free Energy by Adsorption of Impurities; 4.3 Kinetic Models of Impurity Adsorption 4.3.1 Earlier Models4.3.2 Velocity of Curved Steps; 4.3.3 Impurity Adsorption at Kinks in Steps: Kubota-Mullin Model; 4.3.4 Impurity Adsorption at Surface Terrace: Cabrera-Vermilyea Model; 4.3.5 Effectiveness Factor for Impurity Adsorption; 4.3.6 Adsorption of Two Competing Impurities; 4.4 Confrontation of Impurity Adsorption Mechanisms with Experimental Data; 4.5 Time-Dependent Impurity Adsorption; 4.6 Growth Kinetics in the Presence of Impurities; 4.6.1 Basic Kinetic Equations; 4.6.2 Time Dependence of Face Displacement 4.6.3 Dependence of Kinetic Coefficient for Step Motion on Impurity Concentration

Sommario/riassunto

Crystal growth technology involves processes for the production of crystals essential for microelectronics, communication technologies, lasers and energy producing and energy saving technology. A deliberately added impurity is called an additive and in different industries these affect the process of crystal growth. Thus, understanding of interactions between additives and the crystallizing phases is important in different processes found in the lab, nature and in various industries. This book presents a generalized description of the mechanisms of action of additives during nucleation, grow