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Nota di contenuto	Kinetics of First-order Phase Transitions; Contents; Foreword; Preface; 1 Introduction; 2 Basic Equations: Determination of the Coefficients of Emission in Nucleation Theory; 2.1 Introduction; 2.2 Basic Kinetic Equations; 2.3 Ratio of the Coefficients of Absorption and Emission of Particles; 2.3.1 Traditional Approach; 2.3.2 A New Method of Determination of the Coefficients of Emission; 2.3.3 Applications; 2.4 Generalization to Multicomponent Systems; 2.4.1 Traditional Approach; 2.4.2 New Approach; 2.4.3 Applications; 2.5 Generalization to Arbitrary Boundary Conditions 2.6 Initial Conditions for the Cluster-Size Distribution Function2.7 Description of Cluster Ensemble Evolution along a Given Trajectory; 2.7.1 Motivation; 2.7.2 Effective Diffusion Coefficients; 2.7.3 Evolution of the Cluster-Size Distribution Functions; 2.8 Conclusions; 3 Kinetics of Nucleation-Growth Processes: The First Stages; 3.1 Introduction; 3.2 Basic Kinetic Equations; 3.3 Nonsteady-State Effects in the Initial Stage of Nucleation; 3.3.1 Approximative Solution in the Range 1 (<~) n (<~) n(c) - n(c)

3.3.2 Time Scale of Establishment of Steady-State Cluster-Size Distributions in the Range 1 (~) 8n(c); 3.5 Time Interval for Steady-State Nucleation; 3.5.1 Kinetically Limited Growth; 3.5.2 Diffusion-Limited Growth
3.5.3 Nonsteady-State Time Lag and the Time Scale of Steady-State Nucleation3.6 Further Basic Characteristics of Nucleation-Growth Processes; 3.6.1 Number of Clusters Formed by Nucleation; 3.6.2 Average Size of the Clusters; 3.6.3 Time Interval of Independent Growth; 3.7 Time of Steady-State Nucleation and Induction Time; 3.8 Formation of a New Phase with a Given Stoichiometric Composition; 3.8.1 The Model; 3.8.2 Basic Equations; 3.8.3 Applications; 3.9 Summary of Results; 3.9.1 Results for the Range of Cluster Sizes n (>~) n(c); 3.9.2 Results for the Range of Cluster Sizes n (>~) n(c)
3.9.3 Integral Characteristics of the Nucleation-Growth Process3.10 Conclusions; 4 Theory of the Late Stages of Nucleation-Growth Processes: Ostwald Ripening; 4.1 Coarsening; 4.1.1 Introduction: Formulation of the Problem; 4.1.2 Asymptotic Behavior of the Critical Cluster Size; 4.1.3 Asymptotic Behavior of the Distribution Function; 4.1.4 Boundary Effects and Theory of Sintering; 4.1.5 Diffusive Decomposition Involving Different Mass-transfer Mechanisms; 4.1.6 Effects of Competition of Several Mass-Transfer Mechanisms; 4.1.7 Asymptotic Stability of Solid Solutions
4.2 Rigorous Analysis of the Transformation of an Arbitrary Initial Distribution Function into a Universal One

Sommario/riassunto

Filling a gap in the literature, this crucial publication on the renowned Lifshitz-Slezov-Wagner Theory of first-order phase transitions is authored by one of the scientists who gave it its name. Prof Slezov spent decades analyzing this topic and obtained a number of results that form the cornerstone of this rapidly developing branch of science. Following an analysis of unresolved problems together with proposed solutions, the book develops a theoretical description of the overall course of first-order phase transformations, starting from the nucleation state right up to the late stages of