

1. Record Nr.	UNINA9910144748003321
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Titolo	Explosive boiling of superheated cryogenic liquids [[electronic resource] /] / Vladimir G. Baidakov
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Chichester, : John Wiley [distributor], c2007
ISBN	1-280-92159-5 9786610921591 3-527-61066-9 3-527-61065-0
Descrizione fisica	1 online resource (354 p.)
Disciplina	621.59 660.28425
Soggetti	Low temperature engineering Ebullition Nucleate boiling Nucleation Electronic books.
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	Explosive Boiling of Superheated Cryogenic Liquids; Foreword; Contents; Preface; 1 Introduction; 2 Equilibrium, Stability, and Metastability; 2.1 Types of Equilibria: Stability Criteria; 2.2 Boundary of Essential Instability; 2.3 Elements of Statistical Theory; 2.4 Phase Stability Against Finite Perturbations; 2.5 Critical Heterophase Fluctuations; 2.6 Relaxation Processes in Metastable Phases; 2.7 Dynamics of Heterophase Fluctuations; 2.8 Kinetic Nucleation Theory (Multiparameter Version); 2.9 Approximations and Limitations of Classical Nucleation Theory 2.10 Nucleation at a High Degree of Metastability 2.11 Nucleation Bypassing the Saddle Point; 2.12 Some Comments on Nucleation Theory; 3 Attainable Superheating of One-Component Liquids; 3.1 Two Approaches to the Determination of the Work of Formation of a Critical Bubble; 3.2 Boiling-Up Kinetics of Superheated Liquids; 3.3 Elements of

the Stochastic Theory of Nucleation; 3.4 Experimental Procedures in the Analysis of Boiling in Superheated Liquids; 3.5 Quasistatic Methods of Investigating Limiting Superheatings of Liquids; 3.6 Dynamic Methods of Investigating Explosive Boiling-Up of Liquids
 3.7 Results of Experiments on Classical Liquids 3.8 Superheating of Quantum Liquids; 3.9 Surface Tension of Vapor Nuclei; 3.10 Cavitation Strength of Cryogenic Liquids; 3.11 Attainable Superheating of Liquid Argon at Negative Pressures; 3.12 Initiated Nucleation; 3.13 Heterogeneous Nucleation; 4 Nucleation in Solutions of Liquefied Gases; 4.1 Critical Nucleus and the Work of its Formation; 4.2 Theory of Nucleation in Binary Solutions; 4.3 Attainable Superheating of Solutions of Hydrocarbons; 4.4 Methods of Experimentation on Solutions of Cryogenic Liquids
 4.5 Solutions with Complete Solubility of the Components 4.6 Solutions with Partial Solubility of the Components; 4.7 Equation of State and Boundaries of Thermodynamic Stability of Solutions; 4.8 Properties of Critical Bubbles in Binary Solutions; 4.9 Comparison of Theory and Experiment for Binary Solutions; 4.10 Kinetics and Thermodynamics of Nucleation in Three-Component Solutions; 4.11 Attainable Superheatings of Ternary Solutions of Cryogenic Liquids; 5 Nucleation in Highly Correlated Systems; 5.1 Introduction; 5.2 Critical Configuration and its Stability; 5.3 Steady-State Nucleation
 5.4 Peculiarities of New Phase Formation in the Critical Region 5.5 Experimental Investigations of Nucleation in the Vicinity of Critical and Tricritical Points; 5.6 Comparison of Theory and Experiment; 5.7 Nucleation in the Vicinity of a Spinodal Curve; 5.8 Theory of Spinodal Decomposition; 5.9 Experimental Studies of Spinodal Decomposition; 6 Nucleation Kinetics Near the Absolute Zero of Temperature; 6.1 Quantum Tunneling of Nuclei; 6.2 Limiting Supersaturations of (4)He-(3)He-Solutions; 6.3 Formation of Quantum Vortices in Superfluid Helium
 6.4 Quantum Nucleation Near the Boundary of Essential Instability

Sommario/riassunto

The monograph is devoted to the description of the kinetics of spontaneous boiling of superheated liquefied gases and their solutions. Experimental results are given on the temperature of accessible superheating, the limits of tensile strength of liquids due to processes of cavitation and the rates of nucleation of classical and quantum liquids. The kinetics of evolution of the gas phase is studied in detail for solutions of cryogenic liquids and gas-saturated fluids. The properties of the critical clusters (bubbles of critical sizes) of the newly evolving gas phase are analyzed for initial st