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Nota di contenuto	Cluster Processes in Gases and Plasmas; Contents; Preface; 1 Introduction; Part I Cluster Properties and Cluster Processes; 2 Fundamentals of Large Clusters; 2.1 Models for Large Clusters and Processes with Their Participation; 2.2 Stability of Charged Metal Clusters; 2.3 Macroscopic Solid Particles with a Pairwise Interaction of Atoms; 2.4 Macroscopic Solid Surfaces; 2.5 Thermodynamics of Large Liquid Clusters in Parent Vapor; 3 Structures of Solid Clusters with Pairwise Atomic Interaction; 3.1 Clusters of Close-Packed Structures; 3.2 Icosahedral Cluster Structures 3.3 Competition between Cluster Structures 4 Elementary Processes and Processes in Gases Involving Clusters; 4.1 Cluster Collision Processes; 4.2 Attachment of Atoms to Clusters and Cluster Evaporation; 4.3 Cluster Heat Processes in Gases; 4.4 Combustion and Catalytic Processes in Gases Involving Clusters; 5 Clusters in External Fields; 5.1 Electric Properties of Large Clusters; 5.2 Radiative Processes Involving Small Particles; 5.3 Resonance Absorption of Metal Clusters; 5.4 Radiative Processes in the Heat Balance and Relaxation of Clusters; 5.5

Hot Clusters as Light Sources

Part II Cluster Processes in Gases
6 Cluster Transport in Gases and Diffusion-Limited Association of Clusters; 6.1 Transport of Large Clusters in Gases; 6.2 Dynamics of Cluster Motion in Gases; 6.3 Cluster Motion in Gas Flows; 6.4 Pairwise Association of Clusters Limited by Motion in a Gas; 7 Charging of Clusters in Ionized Gas; 7.1 Attachment of Ions to Clusters in Dense Gas; 7.2 Field of a Charged Cluster in Dense Ionized Gas; 7.3 Attachment of Ions to Clusters in Rare Gas; 7.4 Kinetics of Cluster Charging in Ionized Gas; 8 Ionization Equilibrium of Clusters in a Gas
8.1 Ionization Equilibrium for Large Metal Clusters
8.2 Electron Thermoemission of Metal Clusters; 8.3 Ionization Equilibrium for Large Dielectric Clusters; 9 Kinetics of Cluster Growth; 9.1 Cluster Growth Involving Free Atoms; 9.2 Kinetics of Cluster Coagulation; 9.3 Cluster Growth During Gas Expansion in a Vacuum; 9.4 Cluster Growth through Coalescence; 9.5 Heat Regime of Cluster Growth; 9.6 Cluster Growth in a Hot Gas with Metal-Containing Molecules; Part III Complex Plasma; 10 Dusty Plasma; 10.1 Particles in the Positive Column of Glow Discharge; 10.2 Particles in Traps of Gas Discharge
10.3 Structures of Particles in Dusty Plasma
11 Aerosol Plasma; 11.1 Growth and Charging of Aerosol Particles in an External Electric Field; 11.2 Electrical Processes in Aerosol Plasma; 11.3 Growth of Fractal Structures Involving Solid Clusters; 12 Cluster Plasma; 12.1 Clusters in a Dense Arc Plasma; 12.2 Laser Generation of Metal Clusters; 12.3 Generation of Clusters from a Metal Surface; 12.4 Generation of Metal Clusters in Magnetron Discharge; 12.5 Cluster Flow through an Exit Orifice; 12.6 Instability of Cluster Plasma; 13 Conclusion
Appendix A Mechanical and Electrical Parameters of Particles with Ellipsoidal and Similar Shapes

Sommario/riassunto

This reference on cluster physics in materials science draws upon the author's unrivalled experience in plasma science. He covers in detail electromagnetic effects, cluster motion and growth, as well as aerosols, providing the knowledge instrumental for an understanding of nanostructure formation. Around 400 case studies enable readers to directly relate the methods to their own individual tasks or projects.
