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Nota di contenuto	Metal Nanopowders; Contents; Foreword; List of Contributors; Introduction; Chapter 1 Estimation of Thermodynamic Data of Metallic Nanoparticles Based on Bulk Values; 1.1 Introduction; 1.2 Thermodynamic Background; 1.3 Size-Dependent Materials Data of Nanoparticles; 1.4 Comparison of Experimental and Calculated Melting Temperatures; 1.5 Comparison with Data for the Entropy of Melting; 1.6 Discussion of the Results; 1.7 Conclusions; 1.A Appendix: Zeros and Extrema of the Free Enthalpy of Melting Gm-nano; References; Chapter 2 Numerical Simulation of Individual Metallic Nanoparticles 2.1 Introduction2.2 Molecular Dynamics Simulation; 2.2.1 Motion of Atoms; 2.2.2 Temperature and Potential Energy; 2.2.3 Ensembles; 2.2.4 Energy Minimization; 2.2.5 Force Field; 2.2.6 Potential Truncation and Neighbor List; 2.2.7 Simulation Program and Platform; 2.3 Size-Dependent Properties; 2.3.1 Introduction; 2.3.2 Simulation Setting; 2.3.3 Size-Dependent Melting Phenomenon; 2.4 Sintering Study of Two Nanoparticles; 2.4.1 Introduction; 2.4.2 Simulation Setting; 2.4.3 Sintering Process Characterization; 2.5 Oxidation of Nanoparticles in the Presence of Oxygen; 2.5.1 Introduction

2.5.2 Simulation Setting2.5.3 Characterization of the Oxidation Process; 2.6 Heating and Cooling of a Core-Shell Structured Particle; 2.6.1 Simulation Method; 2.6.2 Heating Simulation; 2.6.2.1 Solidification Simulation; 2.7 Chapter Summary; References; Chapter 3 Electroexplosive Nanometals; 3.1 Introduction; 3.2 Electrical Explosion of Wires Technology for Nanometals Production; 3.2.1 The Physics of the Process of Electrical Explosion of Wires; 3.2.2 Nonequilibrium State of EEW Products -Nanometals; 3.2.3 The Equipment Design for nMe Production by Electrical Explosion of Wires Method
3.2.4 Comparative Characteristics of the Technology of Electrical Explosion of Wires3.2.5 The Methods for the Regulation of the Properties of Nanometals Produced by Electrical Explosion of Wires; 3.3 Conclusion; Acknowledgments; References; Chapter 4 Metal Nanopowders Production; 4.1 Introduction; 4.2 EEW Method of Nanopowder Production; 4.2.1 Electrical Explosion of Wires Phenomenon; 4.2.2 Nanopowder Production Equipment; 4.3 Recondensation NP-Producing Methods: Plasma-Based Technology; 4.3.1 Fundamentals of Plasma-Chemical NP Production; 4.3.2 Vortex-Stabilized Plasma Reactor
4.3.3 Starting Material Metering Device (Dispenser)4.3.4 Disperse Material Trapping Devices (Cyclone Collectors and Filters); 4.3.5 NP Encapsulation Unit; 4.4 Characteristics of Al Nanopowders; 4.5 Nanopowder Chemical Passivation; 4.6 Microencapsulation of Al Nanoparticles; 4.7 The Process of Producing Nanopowders of Aluminum by Plasma-Based Technology; 4.7.1 Production of Aluminum Nanopowder; 4.7.2 Some Properties of Produced Nanopowders of Aluminum, Boron, Aluminum Boride, and Silicon; References; Chapter 5 Characterization of Metallic Nanoparticle Agglomerates; 5.1 Introduction
5.2 Description of the Structure of Nanoparticle Agglomerates

Sommario/riassunto

Written with both postgraduate students and researchers in academia and industry in mind, this reference covers the chemistry behind metal nanopowders, including production, characterization, oxidation and combustion. The contributions from renowned international scientists working in the field detail applications in technologies, scale-up processes and safety aspects surrounding their handling and storage.