

<<系统合金科学>>

图书基本信息

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内容概要

Taking Fe , Co , Ni pure metals and Ag - Cu , Ti - Al , Au - Cu systems as examples , the systematic science of alloys has been presented in the monograph , which includes six levels : separated theory of potential energies and volumes for characteristic atoms , valence bond theory of characteristic crystals , separated theory of thermodynamic properties for characteristic crystals , characteristic atom arrangement crystallography of alloy phases , thermodynamics of mixed characteristic crystals for alloy phases and comprehensive theory of mixed characteristic crystals for phase transformation , phase equilibrium and phase diagrams. It may be available for reference to graduates , teachers and researchers.

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书籍目录

Foreword Systematic Science of Alloys and Its Innovation Chapter Ideology and Methodology of Systematic Science of Alloys Theoretical Framework of Systematic Science of Alloys Development Course of Metallic Materials Science and Evolution of Human Thinking Mode Chapter Systematic Science of Pure Metals--Valence Bond Theory of Characteristic Crystals Background and Outline of One-atom Valence Bond Theory of Pure Metals A New Potential Function with Many-atom Interactions in Solid Electronic Structure and Properties of Pure Iron Electronic Structure and Properties of Pure Cobalt Electronic Structure and Properties Ni Metal Chapter Systematic Science of Ag - Cu System Atomic Energies and Gibbs Energy Functions of Ag- Cu Alloys Atomic Volumes and Volume Functions for Ag -Cu Alloys Electronic Structure of Ag- Cu Alloys Phase Diagram and Thermodynamic Properties of Ag -Cu Alloys Chapter Systematic Science of Ti - Al System Influence of XTi/XA on Atomic States, Lattice Constants and Potential-energy Planes of Ordered Fcc TiAl Type Alloys Atomic States, Potential Energies, Volumes, Stability and Brittleness of Ordered Fcc TiAl₃ Type Alloys Atomic States, Potential Energies, Volumes, Stability and Brittleness of Ordered Fcc Ti₃Al Type Alloys Atomic States, Potential Energies, Volumes, Stability and Brittleness of Ordered Fcc TiAl₂ Type Alloys Chapter Systematic Science of Cu -Ni and Au -Ni Systems Microstructure and Properties of Cu- Ni Alloys Relationship Between Partial and Average Atomic Volumes of Components in Au- Ni Alloys Chapter Systematic Science of Au - Cu System Based on Experimental Data of Disordered Alloys Potential Energy Sequences of Characteristic Atoms on Basis of Heats of Formation of Disordered Au (1-x) Cu_x Alloys Volume Sequences of Characteristic Atoms Separated from Experimental Volumes of Disordered Au Cu Alloys Chapter Systematic Science of Au - Cu System Based on First-principles Electron Theory of Alloys Potential Energies of Characteristic Atoms Separated from First-principles Calculated Heats of Formation of AuCu and AuCu₃ Compounds Volumes of Characteristic Atoms Separated from First-principles Calculated Volumes of L10 -AuCu and L12 -AuCu₃ Compounds Chapter Systematic Science of Au- Cu System Based on Experimental Data of Intermetallics Potential Energies of Characteristic Atoms Separated from Experimental Heats of Formation of AuCu and AuCu₃ Compounds Volume Sequences of Characteristic Atoms Separated from Experimental Volumes of AuCu and AuCu₃ Compounds Systematic Science of Au -Cu System Based on Experimental Data of Disordered Alloys : Characteristic Atom Occupation Patterns of Au₃Cu, AuCu₃, AuCu₁ and AuCu₁₁ Energetic Properties of Characteristic Crystals Separated from Experimental Heats of Formation of AuCu and AuCu₃ Compounds Energetic Properties of Disordered Au Cu_x Alloys Obtained on Basis of Experimental Heats of Formation of AuCu and AuCu₃ Compounds Variations in Energetic Properties on Disorder L12 -AuCu₃ Compound Studied on Basis of Experimental Heats of Formation of AuCu and AuCu₃ Compounds Changing with Temperature

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