Computer Simulation Of Thin Nickel Films On Single Layer

This book describes systematically the theory and technology of the precision

forming of large, complex and thin-walled superalloy castings for aircraft engines, covering all the important basic aspects of the manufacturing process, including process design, wax pattern, ceramic molds,

casting and solidification, heat treatment, repair casting and dimension precision control. The correlation of casting defects, structural characteristics and performance of castings is revealed through a range of

tests. It also discusses the latest technologies and advances in this field – such as imaging the solidification process by means of synchrotron radiography, 3D computerized tomography and reconstruction of

microporosity defects, analysis and diagnosis of error sources for dimension over-tolerance and adjusted pressure casting technology – which are of particular interest. Providing essential insights, the book offers a

valuable guide to the design and manufacture of superalloy casting parts for aircraft engines.

Volume 6A Surfaces I

Bell Laboratories Talks and Papers

Solar Energy Update

Metals Abstracts

Investigation of the Fracture Toughness of the Nickel-Alumina System Interface

This Special Issue of Nanomaterials collects a series of original research articles

providing new insight into the application of computational quantum physics and chemistry in research on nanomaterials. It illustrates the extension and diversity of the field and indicates some future

directions. It provides the reader with an overall view of the latest prospects in this fast evolving and cross-disciplinary field

BTL Talks and Papers

Physics Briefs

A Selected Listing of NASA Scientific and Technical Reports for ...

Applied Mechanics Reviews

Transport in Nonstoichiometric Compounds

Nanocrystalline nickel-tungsten

alloys are harder, stronger, more resistant to degradation, and safer to electrodeposit than chromium. Atomistic computer simulations have previously met with success in replicating the energetic and atomic conditions of physical

systems with 2-4nm grain diameters. Here, a new model subjects a vertically thin unique volume containing 3nm or 10nm FCC grains with aligned z axes to a Monte Carlo-type minimization to investigate the segregation and

ordering behavior of W atoms. Short-range order is also tracked with the Warren-Cowley parameter, and energetic results are explored as well. It was found that the Ni-W system has a very strong tendency toward SRO. The

10nm models exhibited more robust order at low concentrations, but ordering in the 3nm model was generally more pronounced. At the dilute limit atoms are driven to the grain boundaries, but as the boundaries are saturated

intragranular ordered formations increase and may even perpetuate over low-angle grain boundaries. Ordering was also observed within the grain boundaries at all concentrations for both diameters. The 10nm models were saturated

at lower concentration, and grain boundary energy was reduced by up to 93%. W atoms preferred to associate with each other as third-nearest neighbors, but at very high concentrations formations with W atoms as second nearest neighbors

were also observed.

Effects of Radiation on Materials

Vacancies and Interstitials in Metals and Alloys

Materials Transactions

NBS Special Publication

ERDA Energy Research Abstracts

Symposium held in Nashville, Tennessee, June 1990. Almost two-thirds of these 91 papers are authored by researchers outside of the US (including information on research in the former USSR, Japan, and Europe). Topics include: current commercial power reactor systems; microstructural characterization

NASA Tech Briefs

Ion-solid Interactions

Computational Quantum Physics and Chemistry of Nanomaterials

U.S. Government Research & Development Reports

NASA SP.

Masters Theses in the Pure and Applied

Sciences was first conceived, published, and disseminated by the Center for Information and Numerical Data Analysis and Synthesis (CINDAS) * at Purdue University in 1 957, starting its coverage of theses with the academic year 1955. Beginning with Volume 13, the printing and dissemination phases of the

activity were transferred to University Microfilms/Xerox of Ann Arbor, Michigan, with the thought that such an arrangement would be more beneficial to the academic and general scientific and technical community. After five years of this joint undertaking we had concluded that it was in the interest of all con

cerned if the printing and distribution of the volumes were handled by an interna tional publishing house to assure improved service and broader dissemination. Hence, starting with Volume 18, Masters Theses in the Pure and Applied Sciences has been disseminated on a worldwide basis by

Plenum Publishing Cor poration of New York, and in the same year the coverage was broadened to include Canadian universities. All back issues can also be ordered from Plenum. We have reported in Volume 28 (thesis year 1 983) a total of 10,661 theses titles from 26 Canadian and 197 United States universities. We

are sure that this broader base for these titles reported will greatly enhance the value of this important annual reference work. While Volume 28 reports theses submitted in-1983, on occasion, certain univer sities do report theses submitted in previous years but not reported at the time.

Accepted by Colleges and Universities of the United States and Canada Volume 28

Proceedings of the International Conference on Vacancies and Interstititials in Metals and Alloys, Held in Berlin, Germany, September 14-19, 1986

Masters Theses in the Pure and Applied

Sciences

Computer Literature Bibliography: 1964-1967

Scientific and Technical Aerospace Reports

The last quarter-century has been marked by the extremely rapid growth of the solid-state

sciences. They include what is now the largest subfield of physics, and the materials engineering sciences have likewise flourished. And, playing an active role throughout this vast area of

science and engineer ing have been very large numbers of chemists. Yet, even though the role of chemistry in the solid-state sciences has been a vital one and the solid-state sciences have, in turn, made

enormous contributions to chemical thought, solid-state chemistry has not been recognized by the general body of chemists as a major subfield of chemistry. Solid-state chemistry is not even

well defined as to content. Some, for example, would have it include only the quantum chemistry of solids and would reject thermodynamics and phase equilibria; this is nonsense. Solid-state

chemistry has many facets, and one of the purposes of this Treatise is to help define the field. Perhaps the most general characteristic of solid-state chemistry, and one which helps differentiate it from solid-state

physics, is its focus on the chemical composition and atomic configuration of real solids and on the relationship of composition and structure to the chemical and physical properties of the solid. Real

solids are usually extremely complex and exhibit almost infinite variety in their compositional and structural features.
JJAP
Computer Simulation and

Electron Microscopy of Crystalline Interfaces
Monte Carlo Study of Fluctuations and Magnetization Reversal in Nickel-iron Ferromagnetic Ultra-thin Films
Nuclear Science Abstracts

Atomistic Computer Simulation Analysis of Nanocrystalline Nickel-tungsten Alloys

Prior to the 9th International Conference on Reactivity Solids in Krakow, Poland a group of about 25 international scientists held a

special conference entitled "Transport in Nonstoichiometric Compounds" in late Aug. 1980 in Mogilany, Poland (near Krakow). This conference was well received in view of the interaction between the participants, as well as the

resulting publication of the proceedings (Elsevier Scientific Publishing Company, 1982, edited by J. Nowotny). At this first conference the participants decided that it would be desirable to organize similar conferences at

about two year intervals. Thus, a second meeting was held in late June, early July at Alenya, Pyrenees Orientales, France. This conference had a larger number of participants, about 50, but still managed to promote excellent

interaction between all the participants. These proceedings, with editors G. Petot-Ervas, Hj. Matzke and C. Monty, have also been published by Elsevier as a special edition of the journal, Solid State Ionics, Vol. 12 (1984). In view

of the success of the initial two conferences, a third meeting was organized and held at The Pennsylvania State University, University Park, PA., 16802, U.S.A. from 11 June 84 to 15 June 84. The proceedings of this conference are

presented in the following text.

Metals Abstracts Index

Regular papers & short notes ICCF8

Materials Transactions, JIM.

Precision Forming Technology of Large Superalloy Castings for

Aircraft Engines

This dissertation presents a Monte Carlo simulation study of fluctuations and magnetization reversal in thin (5, 10 and 20 nanometers thin), permalloy (Ni 81 Fe 19 films. The

study shows how the presence of vertical end pinned domains (VEPDs) in these films leads to nucleation of vortices and anti-vortices. We also show how the vertical edge pinned domains (VEPDs) lead to the

formation of horizontal edge pinned domains (HEPDs) in the course of a films magnetization reversal. A mechanism for HEPD-reversal is discovered, involving the creation and motion of a head-to-head domain wall.

When vortices nucleate to initiate a films magnetization reversal the switching field varies linearly with temperature, and for reversal that starts with growth of VEPDs switching field has a T 2

dependence. Novel images of spin configuration are used to show fluctuations and magnetization reversal. Our thin film's easy-axis is parallel to the length of the film. For a 5 nm thin film, the author shows that

roughness in the edges parallel-to-the-easy-axis increases the switching field of the film in comparison to the switching field of a control film--a similar film with straight edges--by 3.9% in an aspect

ratio 5 film and by 6.7% in an aspect ratio 1.5 film. When roughness, or etching, is in the edges perpendicular-to-the-easy-axis the switching field of such films is less than that of the control film by 2.8% and

by 4.2% in the respective cases. The mechanisms described in this work are of importance in computer memory and data-storage industry, as well for sensor and circuit isolator applications.

Technical Abstract Bulletin
15th International Symposium
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A Selected Listing
Energy Research Abstracts