

Materials Science

Solid State Physics & Engineering

2005/II

Bioceramics 17

Eds. Panjian Li, Kai Zhang
and Clifford W. Colwell, Jr.

Key Engineering Materials Vols. 284-286

The book covers the most recent advances made in the study of bioceramics, and its applications in medicine; especially in the repair of bone defects. The ever-increasing impact of bioceramics is clearly reflected by this volume: the 261 papers conveniently collected together here, cover major topics in the field of bioceramics today. These include biomimetic apatite coatings, hydroxyapatite and other calcium phosphate ceramics, coatings, composites, inorganic-organic hybrids, zirconia and alumina bioceramics, bioactive glasses and glass ceramics, the evaluation of bioactivity in simulated physiological solutions, cell-ceramic interactions, ceramic-tissue interaction, the stability of bioceramics in the body environment, tissue engineering and scaffold materials, bone cement; drug delivery; wear and fixation of implants, surface modification, pre-clinical and clinical studies, dental and orthopaedic applications and effect of sterilization upon ceramic implants.

ISBN 0-87849-961-x

1120 pages, hardcover, 2005, **US\$362.00/€315.00**



New

PRICM-5

Eds. Z.Y. Zhong, H. Saka, T.H. Kim,
E.A. Holm, Y.F. Han and X.S. Xie

Materials Science Forum Vols. 475-479

The proceedings comprise 988 papers from 20 symposia, and the main topics covered are: Structural Materials, Functional Materials, Materials Processing and Characterization. The five-volume set is further divided into carefully targeted sections: Advanced Ferrous Alloys & Processing; Light Metals; Intermetallics & High-Temperature Alloys; Composite Materials; Advanced Ceramics; Advanced Nuclear Materials; Layered and Graded Materials; Combustion Synthesis; Electronic Materials; Smart Materials & Systems; Magnetic Materials; Biomaterials; Hydrogen-Absorbing Materials; Advanced Melt Processing, Casting & Joining; Spray Forming & Rapid Prototyping; Superplasticity & Superplastic Forming; Modeling and Simulation of Materials and Processes; Amorphous, Quasicrystalline and Nanocrystalline Materials; Thin-Film Materials & Processing; Grain Boundary, Interface & Surface Engineering; Materials Characterization & Evaluation.

ISBN 0-87849-960-1

4560 pages, 5-vols. set, paperback, 2005,
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New

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Eds. H.S. Kim, S.-Y. Park, B.Y. Hur and S.W. Lee
ISBN 0-87849-966-0, 698 pages, paperback,
2005, **US\$224.00/€195.00**

New Silicon Carbide and Related Materials 2004

Eds. R. Nipoti, A. Poggi and A. Scorzoni
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2005, **US\$401.00/€349.00**

New Advanced Si-Based Ceramics and Composites

Eds. Hai-Doo Kim, Hua-Tay Lin and Michael J. Hoffmann
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Eds. W. Pan, J. Gong, C.-C. Ge and J.-F. Li
ISBN 0-87849-959-8, 1984 pages, paperback,
2-vols set, 2005, **US\$447.00/€389.00**

New Defects and Diffusion in Metals

Ed. David J. Fisher
ISBN 3-908451-05-1, 358 pages, paperback,
2004, **US\$205.00/€178.00**

New Materials Structure & Micromechanics of Fracture

Ed. Jaroslav Pokluda
ISBN 0-87849-964-4, 425 pages, paperback,
2005, **US\$228.00/€198.00**

New Cross-Disciplinary Applied Research in Materials Science and Technology

Ed. A. Méndez-Vilas
ISBN 0-87849-962-8, 672 pages, paperback,
2005, **US\$228.00/€198.00**

New On the Convergence of Bio-, Information-, Environmental-, Energy-, Space- and Nano-Technologies

Eds. K.H. Chung, Y.H. Shin, S.-N Park et al.
ISBN 0-87849-958-x, 1110 pages, paperback,
2-vols. set, 2005, **US\$343.00/€298.00**

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Silicon Carbide and Related Materials 2004

ECSCRM2004

Eds. Roberta Nipoti, Antonella Poggi and Andrea Scorzoni
Materials Science Forum Vol. 483-485

Silicon Carbide (SiC), Gallium Nitride (GaN) and Diamond are examples of wide-bandgap semiconductors having chemical, electrical and optical properties which make them very attractive for the fabrication of high-power and high-frequency electronic devices, as well as of light-emitters and sensors which have to operate under harsh conditions.

These proceedings fully document the latest experimental and theoretical understanding of the growth of bulk and epitaxial layers, the properties of the resultant materials, the development of suitable processes and of electronic devices that can best exploit and benefit from the outstanding physical properties that are offered by wide-bandgap materials.

0-87849-963-6, hardcover,
1148 pages, 2005, US\$401.00/€395.00



Materials Structure & Micromechanics of Fracture

Ed. Jaroslav Pokluda
Materials Science Forum Vol. 482

This volume contains papers selected from the more than 120 contributions presented during the 4th international conference on "Materials Structure & Micromechanics of Fracture (MSMF-4)", in Brno, Czech Republic, June 23-25, 2004.

Nearly 150 scientists from 21 countries presented a variety of multiscale approaches to the modeling and testing of deformation and fracture processes in engineering materials. In collaboration with the International Advisory Board, the organizers also asked Prof. A. J. McEvily (University of Connecticut, USA), Prof. W. Dietzel (GKSS-Forschungszentrum Geesthacht GmbH, Germany), Prof. G. E. Beltz (University of Santa Barbara, California, USA) and Prof. T. Kitamura (Kyoto University, Japan) to prepare plenary key-note lectures. In addition, other leading scientists were asked to provide key-note lectures for each section. The resultant papers, ordered approximately in a sequence going from atomistic to mesoscopic to macroscopic, are presented in the first section of these proceedings. Papers are similarly ordered in the second section.

The main goal of the book was to demonstrate a variety of multiscale approaches, ranging from atomistic to macroscopic levels, and in this it succeeds admirably.

0-87849-964-4, paperback,
425 pages, 2005, US\$228.00/€198.00



On the Convergence of Bio-, Information-, Environmental-, Energy-, Space- and Nano-Technologies

Eds. Kwang Hwa Chung, Yong Hyeon Shin, Sue-Nie Park, Hyun Sook Cho, Soon-Ae Yoo, Byung Joo Min, Hyo-Suk Lim and Kyung Hwa Yoo
Key Engineering Materials Vols. 277-279

This two-volume set contains the Proceedings of the 1st International Women's Conference on BIEN-Technology, held at Paichai University in Daejeon, Korea, on November 13th - 16th, 2003. This conference provided female scientists with the opportunity to exchange their multidisciplinary expertise and research experience, to enhance interpersonal networking, and to create a synergetic convergence of various emerging technologies such as Bio, Information, Environmental, Energy, Space and Nano technologies.

These proceedings comprise 173 papers, each of which was subjected to technical review by two experts and, in addition, was checked by a native English speaker. The work is divided into the sections: Bio-Technology, Information Technology, Environmental Technology, Energy Technology, Space Technology and Nano Technology.

These volumes will therefore be of great interest to scientists and engineers working in any of these fields.

0-87849-958-x, 2-vols. set, paperback,
1120 pages, 2005, US\$343.00/€298.00

Advances in Engineering Plasticity and Its Applications

Eds. W.P. Shen and J.Q. Xu
Key Engineering Materials Vols. 274-276
0-87849-951-2, 2004, 1230 pages,
US\$362.00/€315.00

Advances in Experimental Mechanics

Ed. M. Lucas
Applied Mechanics and Mat. Vols. 1-2
0-87849-955-5, 2004, 280 pages,
US\$193.00/€168.00

Advances in Materials Manufacturing Science and Technology

Eds. Xing Ai, Jianfeng Li et al.
Materials Science Forum Vols. 471-472
0-87849-956-3, 2004, 930 pages,
US\$343.00/€298.00

Advances in Nondestructive Evaluation

Eds. Seung-Seok Lee et al.
Key Engineering Materials Vols. 270-273
0-87849-948-2, 2004, 2524 pages,
US\$539.00/€469.00

Bulk and Graded Nanometals

Eds. K.J. Kurzydowski and Z. Pakielna
Solid State Phenomena Vols. 101-102
3-908451-02-7, 2005, 364 pages,
US\$205.00/€178.00

Defects and Diffusion in Halides and Ice

A 7-Year Retrospective
Ed. D.J. Fisher
Defect and Diffusion Forum Vol. 229
3-908451-03-5, 2004, 186 pages,
US\$113.00/€98.00

Explosion, Shock Wave and Hypervelocity Phenomena in Materials

Eds. S. Itoh, K. Hokamoto and M. Fujita
Materials Science Forum Vols. 465-466
0-87849-950-4, 2004, 490 pages,
US\$228.00/€198.00

Materials Science, Testing and Informatics II

Ed. J. Gyulai
Materials Science Forum Vols. 473-474
0-87849-957-1, 2005, 620 pages,
US\$228.00/€198.00

Metastable and Nanostructured Materials II

Eds. R.H.G.A. Kiminami and L.A. Pessan
0-87849-954-7, 2004, 116 pages,
US\$113.00/€98.00

Recrystallization and Grain Growth

Eds. B. Bacroix, J.H. Driver et al.
Materials Science Forum Vols. 467-470
0-87849-952-0, 2004, 1472 pages,
US\$447.00/€389.00

Descriptions and Full Table of Contents of Each Title at <http://www.ttp.net>

Defects and Diffusion in Metals

An Annual Retrospective VII

Ed. D.J. Fisher

Defect and Diffusion Forum Vols. 233-234

New

This seventh volume in the series covering the latest results in the field includes abstracts of papers which appeared between the publication of Annual Retrospective VI (Volumes 224-225) and the end of November 2004 (allowing for vagaries of journal availability).

In addition to the abstracts, the issue includes invited original papers on the topics of the Analytical Solution of Fick's Equations in the Case of Foreign Atom Diffusion in a Metallic Sample (A.Benmakhlouf), Analytical Studies of Diffusion by the Dissociative Mechanism in the Case of a Foreign Atom Source (A.Benmakhlouf), Metal Lattice Atomic Structure Characterization using Mirage Effect Technique (K.Boubaker), Microstructure and Texture Evolution during Cold Rolling and Recrystallization of Ni3Al Single Crystals (K.Kishida et al.), Breaking Atomic Bonds through Vibrational Mode Localization (S.V.Dmitriev et al.), The Kirkendall Plane in Binary Interdiffusion Systems (A.A.Kodentsov et al.), Recent Advances in Point Defect Studies Driven by Density Functional Theory (A.Legris), An ab initio Study of the Effects and Stability of Vacancies, Antisites and Small Radius Atoms (B, C, N, and O) in the B2-FeAl Structure (A.Kellou et al.), Diffusion Process Simulations - an Overview of Different Approaches (H.Strandlund et al.), Enhanced Diffusion in γ -Fe and Au by Vacancies Induced under Elevated Hydrogen Pressure (Y.Yamazaki et al.), Modelling Creep Controlled by the Glide of Jogged Screw Dislocations in TiAl and Ti-Based Alloys (S.Karthikeyan et al.) and the Effect of Increase of Dihedral Angle on Thermal Grain Boundary Grooving (W.Zhang et al.). These 12 invited papers and nearly 500 selected abstracts together provide an up-to-date insight into current trends in fundamental metals theory, processing and applications research as related to diffusional phenomena and defect behavior.

3-908451-05-1, paperback,

358 pages, 2004, US\$205.00/€178.00

Advanced Si-Based Ceramics and Composites

Eds. Hai-Doo Kim, Hua-Tay Lin

and Michael J. Hoffmann

Key Engineering Materials Vol. 287

Significant progress has been made over the past 30 years in handling silicon-based ceramics such as silicon nitride, silicon carbide, SiAlON, silicides and composites. A better understanding of processing parameters in various forming techniques, and of microstructure-property relationships, has led to substantial improvements in thermomechanical performance, reliability and cost reduction.

The book is divided into four comprehensive sections: the first chapter is devoted to industrial applications, with both new and on-going applications being introduced. The second chapter presents the various traditional and new techniques being used to process Si-based ceramics and composites. Some classical aspects of grain growth and sintering are presented, as well as relatively new approaches such as the SPS process. The third chapter covers microstructural developments in various Si-based ceramics, and particularly their effect upon mechanical performance and reliability. The fourth chapter discusses the thermo-mechanical and thermo-chemical behaviors of Si-based ceramics; with particular emphasis being placed on environmental barrier coatings.

The book summarizes the current state-of-the-art of our understanding of these materials, and covers up-to-date developments in silicon-based ceramics such as silicon nitride, silicon carbide, SiAlON, silicides, and composites. Industrial case-studies and applications are addressed with regard to the exploration of new frontiers.

0-87849-965-2, softcover,

520 pages, 2005, US\$228.00/€198.00



New

Eco-Materials Processing & Design VI

Eds. H.S. Kim, S.-Y. Park et al.

Materials Science Forum Vols. 486-487

The book will present materials researchers and users with a wealth of new information covering the entire spectrum of ecology, eco-materials, nano-materials, bio-materials, recycling, environmental protection and energy conversion related materials.

It is divided into seven sections: the first deals with photocatalysts for air pollution, water pollution, deodorizing, self-cleaning, power light sources, and the standardization of methodologies in photocatalytic reactivity. The 2nd section covers the incorporation of end-of-life strategies into materials design as well as biomaterials. The 3rd section covers the use of non-hazardous components as substitutes for traditional, but hazardous, components. The 4th section covers the treatment of waste materials, and the 5th section describes manufacturing via the using of more environmentally-friendly processing (eco-processing) and eco-materials design. The final section covers energy-related or energy-conversion related materials such as hydrogen-energy/fuel-cells and batteries. A book not to be missed.

0-87849-966-0, paperback,

698 pages, 2005, US\$224.00/€195.00



New

High-Performance Ceramics III

Eds. W. Pan, J. Gong, C.-C. Ge and J.-F. Li

Key Engineering Materials Vols. 280-283

All of the papers which are collected together in this volume were subjected to peer-review and their topics cover almost every facet of high-performance ceramics. The contents can be divided into five broad sections: structural ceramics, functional ceramics, ceramic processing, ceramic characterization and layered or graded materials. The more than 300 papers, submitted to this volume provide a treasure-house of invaluable information on the latest advances made in China. In addition, some 30 invited papers and about 50 regular papers presented by scholars from other countries - including Japan, Korea, India, France, Portugal, Sweden, Canada, Taiwan and Hong Kong - accurately reflect recent research activities throughout the world.

This volume will therefore be of great interest to any scientist or engineer working in the field of high-performance ceramics.

0-87849-959-8, 2-vols set, paperback,

1984 pages, 2005, US\$447.00/€389.00

Cross-Disciplinary Applied Research in Materials Science and Technology

Ed. A. Méndez-Vilas

Materials Science Forum Vols. 480-481

The selected papers in this book cover Imaging Techniques, Microscopy; Nanoscience and Nanotechnology, Bioengineered Materials, Applied Materials Science / Solid State Physics & Chemistry / Advanced and Functional Materials and Semiconductor Materials and Devices. Applied Physics is seen not really to be a branch of Physics, but rather the application of all of the many branches of Physics to the broad realm of practical problems in Science, Engineering and Industry. This book is truly multi-, and inter-disciplinary. The editors had called for papers which related Physics to other sciences such as Biology, Chemistry, Information Science, Medicine, etc, or which combined various areas of Physics; all with the aim of solving practical problems.

It is a volume which one truly cannot afford to miss reading.

0-87849-962-8, paperback,

672 pages, 2005, US\$228.00/€198.00

New

Diamond Thin Films

An Emerging Technology: Past, Present and Future

Ashok Kumar Dua

Materials Science Foundations Vol. 21

Diamond, as well as being a precious gem, is a versatile material par excellence. No other material comes anywhere near to matching its properties, which are both extreme, and also expressed in rare combinations. This book provides a brief, but complete and authoritative, introduction.

ISBN 0-87849-949-0, 112 pp, 2004, **US\$60.00/€52.00**

student discount available upon request

Fundamentals of Solidification

W. Kurz and D.J. Fisher

This fourth edition is an updated version of the now classic bestseller. As one reviewer noted: The book is highly successful in presenting a unified picture of the majority of solidification phenomena which control the formation of microstructures. Many remarkably simple models have been developed to aid understanding of this often complex subject. After reading this book, the student will feel confident when delving further into solidification-related subjects, and even the experienced engineer will find thought-provoking points. A must for everyone working with solidification related topics.

ISBN 0-87849-804-4, 316 pp, 1998, **US\$83.00/€72.00**,

student discount available upon request

Plastic Deformation and Strain Hardening

Pentti O. Kettunen and Veli-Tapani Kuokkala

Materials Science Foundations Vols. 16-18

The celebrated lectures were given by Professor Pentti O. Kettunen at the Institute of Materials Science of Tampere University of Tech-

nology, as part of the Physical Metallurgy III course which was intended for students specializing in metallic materials. At the end of each chapter there are challenging exercises, which help the reader further in deepening his or her understanding of the current topic, and which will also be a boon to other lecturers who use this as their course book.

ISBN 0-87849-906-7, 430 pp, 2003, **US\$166.00/€144.00**

student discount available upon request

THERMEC'2003

Eds. T. Chandra, Jose Maria Torralba and T. Sakai

Materials Science Forum Vols. 426-232

The Conference brought together researchers and engineers/technologists working on various aspects of the processing, fabrication, structure/property evaluation and applications of both ferrous and non-ferrous materials: including biomaterials, composites and smart/intelligent materials. In addition to the over 600 contributed papers, the conference committee also invited papers from active researchers in various countries. Altogether, the set offers an outstanding wealth of up-to-date information on this field.

ISBN 0-87849-919-9, 4650 pp, 2004, **US\$628.00/€546.00**

Machining of Natural Stone Materials

Ed. Xipeng Xu

Key Engineering Materials Vol. 250

The purpose of this book is to provide an opportunity for academic researchers and industrial experts to summarize the achievements made, and to predict new trends in this area; all in a single volume. This book therefore presents state-of-the-art information concerning the latest research, developments and applications in the field of the machining of natural stone materials.

ISBN 0-87849-927-x, 318 pp, 2003, **US\$182.00/€158.00**

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Solid State Phenomena (8 vols per year, approx 2000 pp/year)

Defect and Diffusion Forum (12 vols per year, (approx. 2000 pp/year))

Journal of Metastable and Nanocrystalline Materials (4 vols per year)

Materials Science Foundations (irregular)

Applied Mechanics and Materials (irregular)

The complete site presently covers about 275,000 pages and grows by over 25,000 pages per year. For more details please visit us at www.scientific.net

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