
Book Reviews

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1 Micro-and Macromechanical Properties of Materials

by: Y. Zhou, L. Yang, Y. Huang, translation Joinlu

Published 2014

by Higher Education Press Beijing, CRC Press

Taylor & Francis Group, 6000 Broken Sound Parkway NW

Suite 300, Boca Raton, FL 33487-2742, USA, 577pp

ISBN: 978-1-4665-9243-8 (hardcover: alk. paper)

Macro- and micromechanical properties of materials is an important area in materials science because mechanical problems related to structural and functional materials during production, processing and application still occur. Properties, such as efficient, safe, environmental-friendly and low-powered, and the efficient use of materials and their lifetime prediction are all based on the systematic analysis of their mechanical properties. The ability to analyse the macro- and micro-mechanical properties of materials is one of the basic skills for all materials science undergraduate and postgraduate students. Yichun Zhou and his colleagues at Xiangtan University, the authors of *Macro- and Micromechanical Properties of Materials*, have written a comprehensive textbook for both students and research scientists.

This book systematically covers macro- and micromechanical properties of metallic and non-metallic structural materials, and various functional materials, as well as the macro- and microfailure mechanisms under various loading conditions. During the preparation of this book the authors were committed to introduce structure and function, macroscopic and microscopic scales, scientific theories, and engineering applications. Some cutting-edge research has also been integrated into this book as strain gradient theory, scale effects, cross-scale numerical simulation, microfracture mechanics, mechanical properties of smart materials, thin films and coatings.

This book has three significant features. First, it is an integration between scientific methods and theories. The development of modern materials science has change rapidly, and it is more useful to learn the fundamentals of scientific methods rather than to learn by rote. This book covers the fundamental of this discipline and the main theories of the subject while also serving as an introduction to research methods. By combining these two individual areas, the book increases the attractiveness of its contents and also helps to stimulate and innovate the research activities of students.

The book contains the following chapters:

- fundamentals of elasto-plastic mechanics
- basic of macro- and micro mechanics

- basic of mechanical properties of materials
- materials hardness and the size effect
- testing of materials fracture toughness
- residual stresses in materials
- creep and fatigue of metals
- mechanical properties of materials in environmental media
- macro- and microcomputational materials mechanics
- mechanical properties of smart materials
- mechanical properties of thin films
- mechanical properties of polymer materials
- ceramics and the mechanical properties of ceramic coating materials
- mechanical properties of composite materials.

2 Hydroxyapatite Coatings for Biomedical Applications, Advances in Materials Science and Engineering Series

by: S. Zhang

Published 2013

by CRC Press, Taylor & Francis Group

6000 Broken Sound Parkway NW, Suite 300

Boca Raton, FL 33487-2742, USA, 445pp

ISBN: 978-1-4398-8693-9 (hardback)

The Advances in Materials Science and Engineering series by CRC Press/Taylor & Francis Group is designed to help meet new and exciting challenges in materials science and engineering discipline. The books and monographs in the series are based on cutting-edge research and development and are thus up to date with new discoveries, new understanding, and new insights in all aspects of materials development, including processing and characterisation and applications in metallurgy, bulk of surface engineering, interfaces, thin films, coatings and composites, to name few.

This book, *Hydroxyapatite Coatings for Biomedical Application*, is dedicated to hydroxyapatite (HA) coatings (films) for biomedical applications. Ha coating are very important in the biological and biomedical coatings fields, especially in the current era of nanotechnology and bioapplications, fields, especially in the current era of nanotechnology and bioapplications given the advance that society has made in recent years. Stainless steel implants or titanium alloys implants are not biotoxic, but they are not bioactive either – they are only bioinsert. For a fast healing effect, a bioactive surface is needed to promote bone growth. HA coatings or its variations can be applied to otherwise bioinactive implants to make their surface bioactive, thus achieving fast heading and recovery.

The book contains the following chapters:

- magnetron sputtering deposition of chemically modified hydroxyapatite
- electrochemical deposition of hydroxyapatite and its biomedical applications
- simultaneous incorporation of magnesium and fluorine ions in hydroxyapatite coatings on metallic implant for osseointegration and stability
- zinc- and fluorine-doped HA coating via sol-gel method
- biomimetic hydroxyapatite materials for therapeutic delivery
- apatite-coated polymer template for implant and drug delivery
- biofunctionalisation on NiTi shape memory alloy promoting osseointegration by chemical treatment
- investigation and application of HA composite coating on the Ti alloy.

This book is special in that it not only compiles data (tables and figures) but also covers material that will be useful for both novices and veterans. I have paid special attention in guiding the authors of each chapter to prepare their chapters in such a way that notice will find the book to be a useful stepping stone to their field and veterans will find it to be a rich source of information for their research. Researches in the fields of nanoscience and nanotechnology, materials science, engineers, postgraduate students, especially those dealing with biomedical and medical research or studies, should also find this book useful.

3 Implementing TWI, Creating and Managing a Skills-Based Culture

by: P. Graupp and R.J. Wrona

Published 2011

by A Productivity Press Book, CRC Press

Taylor & Francis Group, 6000 Broken Sound Parkway NW

Suite 300, Boca Raton, FL 33487-2742, USA, 464pp

ISBN: 978-1-4398-2596-9

Companies are under ever increasing pressure to remain on the competitive cutting edge. A fully engaged workforce is essential for doing this successfully, and training within industry (TWI) is powerful approach to creating and maintaining this engagement. The increasing competitive pressure comes from a variety of forces.

- economic development in Asia, South America, and Eastern Europe has increased the number of potential rivals challenging for customers loyalties
- incredible improvements in communication and transportation have converted those potential rivals in actual ones
- scientific and technological advances compress the half-life on any market offering's viability, increasing the demand for ever faster improvement and innovation in development, design, production and delivery.

These three forces are significant under any circumstances. Add to this the fallout of the world-wide economic recession the last few years. All organisations have to rapidly reconfigure how they bring value to market as customers have become more circumspect in terms of how they are going to satisfy needs that have changed in significant, discontinuous ways.

That workforce engagement is essential is also without question. A naive view might be that increased technological sophistication has increased the capacity for a select brain trust to do the hard 'thinking' of what to sell and how to make it, leaving the remainder of the organisation to do nothing more than be button pushing monkeys for automated equipment and processes.

The authors bring many examples of companies that embraced these elements of TWI, improving their competitiveness by improving their capacity to fully engage their workforce productively. These examples can serve as inspiration and models for years.

4 Energy Harvesting for Autonomous Systems

by: S. Beeby and N. White (Editors)

Artech House Series, Smart Materials, Structures, and Systems,

by: Y. Bar-Cohen, (Series Editor)

Published 2010

by Artech House, Boston, London, 685 Canton Street

Norwood, MA 02062, USA, 308pp

ISBN-13: 978-1-59693-718-5

This unique resource provides a detailed understanding of the options for harvesting energy from localised, renewable sources to supply power to autonomous wireless systems. Professionals are introduced to a variety of types of autonomous systems and wireless networks and explore the capabilities of existing battery-based solutions, RF solutions, and fuel cells. This book focuses on the most promising harvesting techniques, including solar, kinetic, and thermal energy. Readers also learn the implications of energy-harvesting techniques on the design of power management electronics in a system. This in-depth reference discusses each energy-harvesting approach in detail, comparing and contrasting its potential in the field.

The book contains the following chapters:

- introduction
- wireless devices and sensor networks
- photovoltaic energy harvesting
- kinetic energy harvesting
- thermoelectric energy harvesting
- power management electronics
- energy storage
- case study: adaptive energy-aware sensor networks
- concluding remarks.

5 Out of the Present Crisis
Rediscovering Improvement in the New Economy
by: T.T. Burton
Published 2012
by CRC Press, Taylor & Francis Group
6000 Broken Sound Parkway NW, Suite 300
Boca Raton, FL 33487-2742, USA
a productivity press book, 269pp
ISBN: 978-1-4665-0442-4 (alk. paper)

There is certainly no question about the current state of the US economy. Every organisation is facing many new challenges brought on by the 2008 meltdown and slow recovery as they crawl out of the economic rubble. The rate of change is exploding and overwhelming. Instability, chaos, turmoil, and uncertainty have brought with new opportunities for those organisations and approach it the right way. The best response to these new challenges is rapid and large-scale improvement via a different kind of leadership, a rediscovered process of implementation, and totally engaged organisations.

Out of the Present Crisis: Rediscovering Improvement in the new Economy is a contemporary reference guide for all organisations interested in implementing Lean Six Sigma and other strategic improvement initiatives with incredible and lasting success. This book provides a rediscovered but practical view of improvement in the new economy for people from diverse range of industrials: all chief executive officers (CEOs) and their executive teams, middle managers, physicians, nurses, lending officers, claims managers, government agency directors and managers, politicians, union leadership, not-for-profit executives and everyone else with the desire to learn how to implement improvement successfully. The book provides a proven roadmap for success in the economy based on rapid and large-scale change, and the combined strategy of Deming back-to basics, innovation, enabling technology, and adaptive improvement. The next generation of improvement is not another buzzword program; it is a nimble systematic execution of this combined strategy that creates the continuous cultural standard of excellence. The future is a well integrated system of improvement similar to the Toyota Production System (TSP) but more dynamic system that leverages technology and harvests the larger enterprise and extended enterprise opportunities.

This book contains the following chapters:

- the seed of continuous improvement
- infrastructure overview: accelerating continuous improvement
- leadership: building a high-performance culture
- setting a renew course of improvement
- deployment planning for rapid and sustainable results
- execution and sustainability
- transforming culture through internalisation
- the role technology in strategic improvement

- the multimillion-dollar list of improvement opportunities in manufacturing, distribution, and service corporation
- strategic improvement in hospitals
- strategic improvement in government
- epilogue.

This book presents valuable insights and practical guidance gained from the author's extensive experiences helping hundreds of organisations reverse failures and successfully incorporate continuous improvement. This is the contemporary guide to continuous and sustainable improvement in the new economy – for all executives and their organisations, across all industries.

**6 Creating a Lean and Green Business System
Techniques for Improving Profits and Sustainability**
by: **K. Zokaie, H. Lovins, A. Wood and P. Hines**
Published 2012
by **CRC Press, Taylor & Francis Group**
6000 Broken Sound Parkway NW
Suite 300, Boca Raton, FL 33487-2742, USA
a productivity press book, 233pp
ISBN: 987-1-4665-7112-9 (pbk.: alk. paper)

The book offers opportunities for innovation that can simultaneously reduce dependence on natural resources and enhance global prosperity. It explores less understood aspects of lean and green – discussing their evolution independently as well as the opportunities that exist in their integration, highlighting the importance of a cultural shift across the whole company.

Outlining a systematic way to eliminate harmful waste while generation green value, the book explains how to

- become economically successful and environmentally sustainable by adopting the lean and green business system model
- adopt a systematic approach to become lean and green, and development your own roadmap to success
- use the cutting edge tools techniques, and methodologies developed by the authors for environmental improvements.

This book contains the following chapters:

SECTION I: WHY LEAN AND GREEN

- introduction
- need for lean and green business practices in an economic downturn
- lean and green: principles and strategies.

SECTION II: CREATING LEAN AND GREEN BUSINESS SYSTEM

- lean and green business process management
- lean and green business leadership
- lean and green strategy development
- lean and green supply chain collaboration.

SECTION III: THE WAY FORWARD

- lean and green growth: an East Anglian models
- conclusions and wrap up.

The book supplies a new way of thinking that will allow you to boots improvement efforts and create a positively changed work environment – while contributing to the long-term well-being of the environment.

7 Battery Power Management for Portable Devices

by: Y. Barsukov and J. Qian

Published 2013

by Artech House, Boston, London, 685 Canton Street

Norwood, MA 02062, USA, 268pp

ISBN-13: 978-1-60807-491-4

The introduction of Li-ion batteries in 1991 created a tremendous change in the handheld devices landscape. Since then, the energy stored and put to use in palm-sized electronic devices has quadrupled. Devices are continuously getting more power hungry, outpacing battery development. Written by leading engineers in the field, this cutting-edge resource helps professionals over-come this challenge, offering them an insightful over view and in-depth guide to the many varied areas of battery power management for portable devices.

This book includes the latest details on optimising charging circuits, developing battery gauges that provide the longest possible run-time while ensuring data production, and utilising safety circuits that provide multiple independent levels of production for highly energetic batteries. This unique resource with the real-world perspective needed to put this knowledge into practice. Readers learn how to perfect their designs, helping to ensure the development of devices that will succeed in the fast-growing portable device marketplace.

This book contains the following chapters:

- battery chemistry fundamentals and character
- battery charger techniques
- battery safety and protections
- cell-balancing techniques: theory and implementation

- battery fuel gauging: state of charge, remaining capacity, and state of health indication
- system considerations
- design examples: complete battery solutions for specific portable systems.

8 Gis for Enhanced Electric Utility Performance

by: B. Meehan

Published 2013

by Artech House, Boston, London, 685 Canton Street

Norwood, MA 02062, USA, 225pp

ISBN-13: 978-1-60807-559-1

This book contains the following chapters:

- GIS and the business of utility
- location matters for energy supply
- electric transmission and GIS
- the GIS electric distribution facilities model
- electric distribution development and operations
- emergency and outage management
- GIS enhances the retail business
- GIS and shared support services
- GIS 101 for electric utilities
- the facility model, GIS, and smart grid.

This book is for information technology managers and executive geographic information systems managers, system integrators, and application providers. Utility executives, managers, and operating supervisors will also find the book helpful to gain an appreciation of the how GIS is structured and built. This book can also help organisations better manage, integrate, and use their GIS to add real value to their business.

Historically, a single electric utility handled the entire supply chain of power delivery, production, wholesale delivery, local delivery, and retail. Over the last decade or so, utility regulators have required these vertically integrated utilities to unbundle their business into the component parts. Yet, many of these vertically integrated utilities remain. So the organisation of this book is along the lines of a typical vertically integrated utility. Regardless of whether a separate company or a separate division handles generation or transmission, the use of GIS technology and the workflows are the same.

The book has eight chapters, an introduction, and two appendices. The introduction describe what GSI is provides a glimpse into what the future of GSI may well be, including the use of Cloud computing and the broader use of smart mobile devices. Chapter 1 is an overview of how GSI fits within the utility business model. It gives some

history of how electric utilities have used GSI and includes some common barriers to its broader application. The following chapter detail how each major division within a utility has used GSI or could use GSI to enhance their business. The detail energy supply, which includes generation, wholesale or electric transmission, electric distribution, emergency management, customer care, and shared services. Appendix B focuses on GIS smart grid.

The book contains a list of recommended resources for further study and research. It contains a list reference book and papers on how real utilities successfully deployed the technology.