

Practical Guide to Designed Experiments: A Unified Modular Approach

Paul D. Funkenbusch
(Marcel Dekker, 2005)
197 pages; \$99.95
ISBN 0-8247-5388-7

Inspired by the work of Genichi Taguchi and his contributions to the field of quality engineering and improvement, Paul Funkenbusch has written an informative textbook on the subject of designed experiments. Although the book is aimed at upper-level undergraduate and first-year graduate students, practicing engineers who need an introduction to the subject will also find it useful.

The first chapter, "How a Designed Experiment Works," provides an excellent roadmap to the rest of the book, but does so in the form of an integrated example, rather than a chapter-by-chapter synopsis. Exhibiting good pedagogical style, the author gives numerous previews of coming attractions as he describes his prototypical example: the optimization of a polishing fluid delivery system.

Throughout the book, all notation and terminology are carefully explained. Chapter 2 introduces the "Fundamental Concepts" of design, with particular attention to quality and improvement. Quality is defined in terms of the economic cost of having a component which does not exactly match specifications. The traditional pass/fail test is contrasted with Taguchi's quadratic loss function.

No book on experimentation would be complete without some discussion of the statistical treatment of experimental data. Chapter 3 on "Statistical Concepts" emphasizes ANOM (analysis of means) and ANOVA (analysis of variance) and provides just enough information for the reader to understand the analysis performed in the rest of the book.

Each subsequent chapter builds on the concepts introduced in previous chapters. Chapters 4–6 unfold the core techniques for the setup and analysis of a designed experiment, including the use of arrays to track the results of two-level treatment conditions, examination of signal-to-noise ratios, and the effects of so-called noise conditions, or variables that cannot be controlled in the field. Chapter 7 generalizes these techniques to include conditions with more than two levels. Chapter 8 delves into more sophisticated techniques for analysis of the results, including the use of normal probability plots. Of particular note is the important distinction between *repeated measurements* of a particular effect during a given run and *replication* of the entire experiment.

With the exception of the first chapter, whose function is to provide an overview of the entire book, all chapters include well-chosen homework and discussion problems. The exercises include a good balance of quantitative problems and opportunities for reflection on the concepts introduced.

Reviewer: Barry B. Luokkala is a teaching professor and director of undergraduate laboratories in the Department of Physics at Carnegie Mellon University. He is also program director of the Pennsylvania Governor's School for the Sciences, hosted by the Mellon College of Science at Carnegie Mellon.

Fatigue Testing and Analysis: Theory and Practice

Ying-Li Lee, Jwo Pan, Richard Hathaway, and Mark Barkey
(Elsevier, 2005)
402 pages; \$89.95
ISBN 0-7506-7719-8

Engineering materials are often subjected to mechanical and/or cyclic loading. In a variety of applications, such as in the automotive, aerospace, nuclear, and electronics industries, cyclic fatigue is the primary cause of failure, resulting in costs of more than \$100 billion per year. As such, it is surprising that few textbooks have been written on the materials engineering aspects of fatigue. The primary book in this area is that of S. Suresh (*Fatigue of Materials*, 2nd ed., Cambridge University Press, 1998), where the fundamentals of fatigue of materials are covered in good detail.

The book by Lee, Pan, Hathaway, and Barkey, *Fatigue Testing and Analysis: Theory and Practice*, is quite different, both in its scope and targeted audience. This book is more suitable for engineers in the automotive industry. It focuses on the practical and testing aspects of fatigue, rather than on the fundamentals of fatigue. Several chapters are devoted to testing methodology, such as "Transducers and Data Acquisition," "Reliability Demonstration Testing," "Development of Accelerated Life Test Criteria," and "Fatigue of Spot Welds." The rest of the book covers the standard repertoire of fatigue analysis in design. These include stress and strain-based fatigue analysis and design, cycle counting techniques, and empirical damage models.

The book could have been better organized. It begins with a chapter on transducers and data acquisition. There is no introduction on the fundamental concepts and importance of fatigue. It would have been beneficial to have an introductory chapter on the basics of fatigue so that the reader can fully appreciate the subsequent chapters. In addition, the book seems to be

lacking in the area of new developments in the field. Topics on novel testing techniques, such as ultrasonic fatigue, would be highly desirable. Here, specimens can be fatigued to 10^9 – 10^{10} cycles, much longer than is obtainable using conventional techniques.

In conclusion, *Fatigue Testing and Analysis* is a good book for the practicing engineer, particularly one in the automotive industry. It contains important information on the fatigue testing of components and the relevant analysis required in design. It is probably not suitable, however, for a university course on fatigue.

Reviewer: Nik Chawla is an associate professor in the Department of Chemical and Materials Engineering at Arizona State University. His research interests encompass mechanical behavior and the modeling of advanced materials at bulk and small length scales.

Scanning Electron Microscopy and X-Ray Microanalysis (3rd Edition)

Joseph Goldstein, Dale E. Newbury, David C. Joy, Charles E. Lyman, Patrick Echlin, Eric Lifschin, Linda Sawyer, and Joseph Michael
(Kluwer Academic/Plenum Publishers, New York, 2003)
689 pages plus CD; \$63.45
ISBN 0-306-4729-29

The third edition of the book by Goldstein and co-authors continues to be the desk reference for scanning electron microscopy and x-ray microanalysis. From the basics of electron–solid interactions to electron backscattered diffraction (a new topic for this edition), this text is an essential and comprehensive guide to the operation of scanning electron microscopy (SEM) and the understanding of SEM and co-located analytical techniques, more generally. The authors clearly explain the physical phenomena underlying the formation of images as well as potential artifacts and pitfalls. There is also an appropriate level of detail on specimen preparation for a wide range of hard and soft materials. As such, it is an excellent resource for students as well as professionals of all levels in the materials sciences and related disciplines.

There are a number of new or expanded sections since the second edition. These include a much expanded section on imaging and microanalysis in variable-pressure and environmental SEMs, particle analysis with x-rays, low-voltage (high-resolution) microanalysis, focused ion-beam systems for imaging and specimen preparation, electron backscattered diffraction, and the latest (and for the most

part very relevant) developments in x-ray detector technology.

There are, however, several areas lacking in this text. The first would be spectral imaging, where complete spectra are acquired from a series of pixels covering an area. More powerful than traditional x-ray mapping, this technique was first described for x-ray microanalysis in 1977 and was made commercially available on electron-beam instruments in 1995. The past 10 years have seen this important method become available from every energy-dispersive x-ray analyzer manufacturer. The main advantage to spectral imaging over mapping is that the data can be analyzed after the fact and re-analyzed if needed for unanticipated elements. Additionally, there are a number of spectral image data analysis tools commercially and otherwise available. Today's and tomorrow's operators of scanning electron microscopes need guidance on the best practices for instrumental settings, acquisition parameters, and analysis strategies for spectral imaging. Second, the material on the extra CD could be organized better. There is some very useful material there that would be more accessible with a web-browser-like interface with an index and search capability.

Despite a few shortcomings, this book remains the definitive text for teaching scanning electron microscopy and associated techniques to students. The material added/expanded since the second edition will be invaluable to both experienced and inexperienced practitioners alike.

Reviewer: Paul G. Kotula is a Principal Member of Technical Staff in the Materials Characterization Department at Sandia National Laboratories in Albuquerque, N.M. His primary research areas are x-ray microanalysis in scanning electron microscopy and scanning transmission electron microscopy as well as more generally in analytical imaging (spectral imaging with photons, electrons, and ions) and multivariate statistical analysis.

Fundamentals of Creep in Metals and Alloys

M.E. Kassner and M.T. Pérez-Prado
(Elsevier, 2004)
xv + 272 pages; \$195.00
ISBN 0-08-043637-4

This book is offered as "both a review and a critical analysis of investigations in a variety of areas relevant to creep plasticity." The aim is "to cover the basic work...but especially to emphasize more recent developments." That the aim is not well achieved can be attributed largely to the breadth and complexity of the subject of creep, illustrated by the fact that the 241 text pages of this book are preceded

by five pages of symbols and abbreviations. The design of a book on creep can take several forms. An exhaustive presentation and critical analysis would take several large volumes. The authors might alternatively select a few idealized models of creep phenomena, select a few examples of observations where one of these models seems to be predominantly controlling, and leave the readers with the happy if mistaken impression that they have some idea of what creep is all about. The senior author of the present book has a wide experimental experience of creep. He knows, and believes his reader should know, that for every experimental example there are four counterexamples. There is no room for a "critical analysis." What the reader will find useful is essentially a *catalogue raisonné* of existing knowledge of the work published up to 2003, a total of 841 references, illustrated by 118 figures.

Unfortunately, the desire to be up-to-date has resulted in some careless presentation. To give a few examples, there is no scale on the abscissa of Figure 15 and the first three sentences below Equation 17 are almost impenetrable, as are the two beginning at the bottom of page 82. Indeed, the style is well described in the authors' own words as "both coherent and, but generally, incoherent." The description of Mughrabi's model on page 57 does not make clear the balance between frictional stresses and long-range directed stresses, which is the essence of that analysis.

Proofreading errors were found as well. For example, the caption of Figure 76 refers to nonexistent shaded bands, Equation 127 is mathematically impossible, Reference 795 on page 215 should be "800," and page 232 refers to "theoretical curves in Figure 95," which is a crystal model. Some words, such as "substructure" and "cavity," are randomly capitalized, even to the point of the appearance on page 234 of a sentence beginning with "cavity" with a small "c."

The reviewer has devised several simple models of creep processes. He clings to the belief that when experimental observations deviate from the theoretical predictions, it is because several simple processes are working in parallel.

Reviewer: F.R.N. Nabarro, Honorary Professorial Research Fellow at the University of the Witwatersrand, has held various offices at the university, including head of the Department of Physics. His principal research interest is in the atomic processes underlying the strength of metals and alloys. He is the author or co-author of several books, including *Theory of Crystal Dislocations*, originally

published in 1967, and more recently, *The Physics of Creep* (1995).

Springer Handbook of Condensed Matter and Materials Data

W. Martienssen and H. Warlimont, eds.
(Springer-Verlag, 2005)
1120 pages; \$249.00
ISBN 3-540-44376-2

The editors' objective was to produce a desktop reference volume that would cover materials broadly, compiling selected data and functional relationships on all material types with minimal introductory and explanatory text. In this, they have largely succeeded. The book was intended to serve students, scientists, and engineers needing information on solid-state science and materials technology. The resulting book of more than 1100 pages contains over 1000 graphs and over 900 tables with some supporting text. The contributing authors are mostly German (18), but 11 contributors are from six other countries. Strangely, contributors' names do not appear with the individual chapters, but only with the sub-index at the beginning of each of the five parts of the volume. Brief biographical sketches appear in an appendix to the book.

The book is divided into 16 chapters, grouped in five parts: Part 1, General Tables (Fundamental Constants, SI System of Units, Crystallography); Part 2, The Elements (The Elements); Part 3, Classes of Materials (Metals, Ceramics, Polymers, Glasses); Part 4, Functional Materials (Semiconductors, Superconductors, Magnetic Materials, Dielectric and Electro-Optical Materials, Ferroelectric and Anti-Ferroelectric Materials); and Part 5, Special Structures (Liquid Crystals, Surfaces, and Mesoscopic and Nanostructured Materials). Surprisingly, there is only incidental mention of some other major materials groups (e.g., biomaterials, lubricants, fuels, coatings, molten salts, adhesives, solders, and brazing materials) and materials with special functions (e.g., damping, friction and wear, sensing, and reaction).

Various sources were used from which to extract data for inclusion. This task was immeasurably facilitated by the fact that Martienssen since 1994 has been editor in chief of the Landolt-Börnstein data compilations. Data from this source and other Springer publications were the primary sources used, but other published compilations were used as well, in addition to numbers extracted from the original literature. Despite these efforts, there are still some deficiencies with regard to data sources: not all relevant compilations have been considered, often the cited edition of

a particular compilation is not the latest, and almost no on-line data sources are referenced.

The two major strengths of the handbook are its comprehensiveness and the numerous assists provided for the reader. The comprehensiveness extends, for materials, from fundamental constants to properties of elements; properties of single, binary, and ternary systems; and properties of complex commercial alloys, mixtures, and systems. With reference to properties, the range of discussion extends from basic properties such as density, melting point, and elastic modulus to complex engineering properties such as creep strength, stain resistance, corrosion resistance, and cupping index. Obviously, the particular properties presented vary from one materials group to another.

The effort to be user-friendly is exhibited in several different ways, beginning with the general organization of the book. The inside covers are exploited to provide convenient access to the most frequently needed reader assists. The front inside cover includes a concise description of the organization of the handbook and a periodic table. The back inside cover presents a table of recommended values of the most frequently used fundamental constants and a CD version of the handbook itself. Other aspects contributing to reader assistance include uniform formats for the presentation of data, the fact that all data for a given material are assembled in one place, and the inclusion of built-in guidelines for the use of tables and graphs. Another instance of helpful assistance is the inclusion of three separate mini-indices within the chapter on elements,

where the elements are ordered first by their names, then by their chemical symbols, and finally by their atomic numbers. Other assists to the reader are the references accompanying each chapter, a list of abbreviations (actually, only acronyms), a detailed table of contents, and a subject index. None of these are all they might have been. With regard to references, the number of references per chapter ranges from two to more than 600!

Presumably, the sources of the data shown are adequately referenced, but nonetheless many well-known and valuable data compilations and guides, be they print, on-line, or CDs, are surprisingly omitted. References are mostly up to date, but many are more than 40 years old, a few are over 100 years old, some carry no date, and three chapters have no references beyond the millennium year (2000). The reference sources are heavily nationally biased (>80% German and U.S. authors); Japanese and Russian authors are notably neglected. Some references (19 of 59 in the chapter on magnetic materials) are given only by the author's name and year, with no indication of the publication source. Confusingly, the same reference number is used for each sequential chapter in each of the five parts of the handbook (e.g., there are five different references, all called 1.2, one in the first chapter of each of Parts 1–5; and four different references, all called 2.2, in the second chapters of Parts 1, 3, 4, and 5; Part 2 has only a single chapter). Some sources appear multiple times with different assigned numbers in the reference list of the same chapter.

The acronym list at the front of the book defines less than half of those actually encountered in the book and fails to

cross-reference some other such lists elsewhere in the book (pp. 482–483 and pp. 1026–1028). The so-called “Detailed Table of Contents” (pp. 1029 ff.) is only modestly so, providing an average of about three sub-topics for each entry in the conventional Table of Contents at the front of the book and no sub-sub-topics.

The subject index is especially troubling. It is primarily alphabetical, with little hierarchical structure, no cross-referencing, and many major omissions. For example, corrosion resistance and corrosion behavior are presented extensively in many sections of the book, yet the subject index gives but two page citations, which lead only to trivial mentions of the word “corrosion.” Grain boundaries and intermetallics appear nowhere in the index, but again each topic is extensively treated in the book. To cite yet another example, the entry “alloy” lists only seven families of alloys, yet there are numerous other entries under alloy family names (e.g., steels, refractory metals, ternary, and wrought). A comprehensive author index, which would have been of great help to readers, is omitted.

In sum, we have here a very useful book, well conceived and organized, but occasionally imperfectly executed. It is to be hoped that its market success will be such that a second edition will soon be forthcoming that can remedy defects such as those noted.

Reviewer: Jack H. Westbrook is the owner of and principal consultant with Brookline Technologies, a consulting firm in Ballston Spa, N.Y., where he consults on materials and technical information systems. He is chair of the MRS Bulletin Book Review Board and serves on the MRS Bulletin Editorial Board.

The following recently published books, relevant to materials research, have come to *MRS Bulletin's* attention. Some of the books listed here may be reviewed in future issues of *MRS Bulletin*. To review a book from the list or to offer recommendations of additional books, contact K. Wilson, Editorial Assistant, *MRS Bulletin*, 506 Keystone Drive, Warrendale, PA 15086-7573, USA; e-mail bulletin@mrs.org.

Applications of Materials

Applied Surfactants: Principles and Applications, Tharwat F. Tadros, John Wiley & Sons, 2005, 740 pp., \$270.00, ISBN 3-527-30629-3.

Delivery System Handbook for Personal Care and Cosmetic Products: Technology, Applications, and Formulations, Meyer R. Rosen, ed., William Andrew Publishing, 2005, 1000 pp., \$295.00, ISBN 0-8155-1504-9.

Drug Delivery: Principles and Applications, Binghe Wang, Teruna J. Siahaan, and Richard A. Soltero, John Wiley & Sons, 2005, 470 pp., \$99.95, ISBN 0-471-47489-4.

Engineering Materials 1: An Introduction to Properties, Applications, and Design, 3rd Edition, Michael Ashby and D.R.H. Jones, William Andrew Publishing, 2005, 448 pp., \$49.95, ISBN 0-7506-6380-4.

Handbook of Adhesion, 2nd Edition, D.E. Packham, ed., John Wiley & Sons, 2005, 692 pp., \$240.00, ISBN 0-471-80874-1.

Nanotechnology: Environmental Applications and Solutions, Louis Theodore and Robert G. Kunz, John Wiley & Sons, 2005, 392 pp., \$99.95, ISBN 0-471-69976-4.

Nanotechnology: Global Strategies, Industry Trends, and Applications, Jurgen Schulte, ed., John Wiley & Sons, 2005, 208 pp., \$89.95, ISBN 0-470-85400-6.

Negative-Refraction Metamaterials, George V. Eleftheriades and Keith G. Balmain,

John Wiley & Sons, 2005, 418 pp., \$74.95, ISBN 0-471-60146-2.

Rheometry of Pastes, Suspensions, and Granular Materials: Applications in Industry and Environment, Philippe Coussot, John Wiley & Sons, 2005, 291 pp., \$89.95, ISBN 0-471-65369-1.

Sensors Applications, Vol. 6: Sensors in Aerospace Technology, Hans Peter Roeser, Maria von Schoenermark, and Erick T. Young, eds., John Wiley & Sons, 2005, 500 pp., \$235.00, ISBN 3-527-29554-2.

Smart Technology for Aging, Disability and Independence: The State of Science, William C. Mann, John Wiley & Sons, 2005, 400 pp., \$84.95, ISBN 0-471-69694-3.

Experimental Techniques

Concise Encyclopedia of Materials Characterization, 2nd Edition, Robert Cahn, ed., William Andrew Publishing, 2005, 1120 pp., \$310.00, ISBN 0-08-044547-0.

History, Biography & Unclassified

The Art of Scientific Writing: From Student Reports to Professional Publications in Chemistry and Related Fields, Hans F. Ebel, Claus Bliefert, and William E. Russey, John Wiley & Sons, 2004, 608 pp., \$35.00, ISBN 3-527-29829-0.

Materials Science and Technology: A Comprehensive Treatment, Vols. 1–11, Robert Cahn, Peter Haasen, and E.J. Kramer, eds., John Wiley & Sons, 2005, 14,000 pp., \$780.00 ISBN 3-527-31395-8.

Inorganic Chemistry, Electrochemistry, Other Chemistry, & Ceramics

Activated Carbon, Harry Marsh and Francisco Rodriguez Reinoso, William Andrew Publishing, 2005, 400 pp., \$185.00, ISBN 0-08-044463-6.

Chemically Bonded Phosphate Ceramics, Arun Wagh, World Scientific, 2004, 400 pp., \$155.00, ISBN 0-08-044505-5.

Corrosion Handbook: Corrosive Agents and Their Interaction with Materials, Vol. 3: Hypochlorites, Phosphoric Acid, Gerhard Kreysa and Michael Schutze, eds., John Wiley & Sons, 2005, 552 pp., \$495.00, ISBN 3-527-31119-X.

Functional Fillers for Plastics, Marino Xanthos, ed., John Wiley & Sons, 2005, 400 pp., \$210.00, ISBN 3-527-31054-1.

Materials Processing

Electroplating: Basic Principles, Processes, and Practice, Nasser Kanani, William Andrew Publishing, 2005, 225 pp., \$195.00, ISBN 0-85617-451-4.

Green Separation Processes: Fundamentals and Applications, Carlos A.M. Afonso and Joao P.S.G. Crespo, eds., John Wiley & Sons, 2005, 368 pp., \$180.00, ISBN 3-527-30985-3.

Microengineering of Metals and Ceramics: Design, Advanced Replication Techniques, and Properties, Henry Baltes, Oliver Brand, Gary K. Fedder, Christofer Hierold, Jan G. Korvink, Osamu Tabata, and Detlef Löhe, eds., John Wiley & Sons, 2005, 400 pp., \$245.00, ISBN 3-527-31208-0.

Nanofabrication Towards Biomedical Applications: Techniques, Tools, Applications, and Impact, Challa S.S.R. Kumar, Josef Hormes, and Carola Leuschner, eds., John Wiley & Sons, 2005, 450 pp., \$180.00, ISBN 3-527-31115-7.

Sintering: Densification, Grain Growth, and Microstructure, Suk-Joong L. Kang, William Andrew Publishing, 2005, 280 pp., \$79.95, ISBN 0-7506-6385-5.

Metallurgy

Multicomponent Phase Diagrams: Applications for Commercial Aluminum Alloys, D. Eskin, A. Belov, and A. Aksenov, eds., William Andrew Publishing, 2005, 450 pp., \$204.00, ISBN 0-08-044537-3.

Physics & Electronics

CMOS-MEMS, Henry Baltes, Oliver Brand, Gary K. Fedder, Christofer Hierold, Jan G. Korvink, and Osamu Tabata, eds., John Wiley & Sons, 2005, 600 pp., \$250.00, ISBN 3-527-31080-0.

Dilute Nitride Semiconductors, Mohamed Henini, William Andrew Publishing, 2005, 640 pp., \$215.00, ISBN 0-08-044502-0.

Fluids, Materials, and Microgravity: Numerical Techniques and Insights into Physics, Marcello Lappa, William Andrew Publishing, 2005, 350 pp., \$195.00, ISBN 0-08-044508-X.

From Lodestone to Supermagnets: Understanding Magnetic Phenomena, Alberto Passos Guimarães, John Wiley & Sons, 2005, 200 pp., \$27.95, ISBN 3-527-40557-7.

Handbook of Optical Systems, Vol. 1: Fundamentals of Technical Optics, Herbert Gross, John Wiley & Sons, 2005, 750 pp., \$230.00, ISBN 3-527-40377-9.

Materials Science in Microelectronics I: The Relationships between Thin Film Processing and Structure, 2nd Edition, Eugene Machlin, William Andrew Publishing, 2005, 300 pp., \$165.00, ISBN 0-08-044640-X.

Nanoelectronics and Information Technology, 2nd Edition, Rainer Waser, ed., John Wiley & Sons, 2005, 995 pp., \$114.00, ISBN 3-527-40542-9.

Nanoscale Science and Technology, Robert Kelsall, Ian W. Hamley, and Mark Geoghegan, eds., John Wiley & Sons, 2005, 472 pp., \$99.95, ISBN 0-470-85086-8.

Optoelectronic Devices: III Nitrides, Mohamed Henini and M. Razeghi, William Andrew Publishing, 2005, 592 pp., \$195.00, ISBN 0-08-044426-1.

Physics of Solar Cells: From Principles to New Concepts, Peter Würfel, John Wiley & Sons, 2005, 198 pp., \$75.00, ISBN 3-527-40428-7.

Superlattice to Nanoelectronics, Raphael Tsu, William Andrew Publishing, 2005, \$140.00, ISBN 0-08-044377-X.

Polymer Chemistry & Biomaterials

Active Sites of Polymerization, Yu.B. Monakov, N.N. Sigaeva, and V.N. Urazbaev; G.E. Zaikov, ed., Brill Academic Publishers, 2005, 400 pp., \$229.00, ISBN 90-6764-424-2.

Bio-Based Polymers and Composites, Richard Wool and X. Susan Sun, World Scientific, 2005, 640 pp., \$99.95, ISBN 0-12-763952-7.

Bioelectronics: From Theory to Application, Itamar Willner and Eugenii Katz, eds., John Wiley & Sons, 2005, 492 pp., \$255.00, ISBN 3-527-30690-0.

Biopolymers for Medical and Pharmaceutical Applications, Alexander Steinbuchel and Robert H. Marchessault, eds., John Wiley & Sons, 2005, 1146 pp., \$303.95, ISBN 3-527-31154-8.

Biotreatment of Industrial Effluents, Mukesh Doble and Anil Kumar, William Andrew Publishing, 2005, 336 pp., \$79.95, ISBN 0-7506-7838-0.

Environmental Biotechnology: Concepts and Application, Hans-Joachim Jordingen and Josef Winter, eds., John Wiley & Sons, 2005, 380 pp., \$140.00, ISBN 3-527-30585-8.

Handbook of Condensation Thermoplastic Elastomers, Stoyko Fakirov, ed., John Wiley & Sons, 2005, 650 pp., \$330.00, ISBN 3-527-30976-4.

Handbook of Polymer Reaction Engineering, Thierry Meyer and Jos Keurentjes, eds., John Wiley & Sons, 2005, 980 pp., \$450.00, ISBN 3-527-31014-2.

Introduction to Polymer Viscoelasticity, Third Edition, Montgomery T. Shaw and William J. MacKnight, John Wiley & Sons, 2005, 316 pp., \$99.95, ISBN 0-471-74045-4.

Macromolecules Containing Metal and Metal-Like Elements, Vol. 4: Group IV Metals, Alaa S. Abd-El-Aziz, Charles E. Carraher Jr., Charles U. Pittman Jr., and Martel Zeldin, John Wiley & Sons, 2005, 346 pp., \$125.00, ISBN 0-471-68238-1.

Macromolecules Containing Metal and Metal-Like Elements, Vol. 5: Metal-Coordination Polymers, Alaa S. Abd-El-Aziz, Charles E. Carraher Jr., Charles U. Pittman Jr., and Martel Zeldin, John Wiley & Sons, 2005, 424 pp., \$125.00, ISBN 0-471-68237-3.

Plastics China: Technologies, Markets, and Growth Strategies to 2008, Donald V. Rosato, William Andrew Publishing, 2005, 300 pp., \$250.00, ISBN 1-85617-444-1.

Polyolefins: Processing, Structure Development, and Properties, James L. White and David D. Choi, Hanser Gardner Publications, 2005, 271 pp., \$129.95, ISBN 0-56990-369-7.

Reinforced Plastics Handbook, 3rd Edition, Donald V. Rasato and Dominick V. Rosato, William Andrew Publishing, 2005, 624 pp., \$275.00, ISBN 1-85617-450-6.

Science and Technology of Rubber, 3rd Edition, James Mark and Burak Erman, eds., William Andrew Publishing, 2005, 784 pp., \$125.00, ISBN 0-12-464786-3.

Tissue Engineering: Essentials for Daily Laboratory Work, Will W. Minuth, Raimund Strehl, Karl Schumacher, John Wiley & Sons, 2005, 350 pp., \$145.00, ISBN 3-527-31186-6.

Structure of Materials

Composite Structures, Design, Safety, and Innovation, Bjorn Backman, William Andrew Publishing, 2005, 250 pp., \$165.00, ISBN 0-08-44545-4.

Properties of Materials: Anisotropy, Symmetry, Structure, Robert E. Newnham, Oxford University Press, 2004, 378 pp., \$59.00, ISBN 0-19-852076-X.

Quasicrystals: Structure and Physical Properties, Hans-Rainer Trebin, ed., John Wiley & Sons, 2003, 672 pp., \$190.00, ISBN 3-527-40399-X. □