Books

Green Supply Chain Management: Product Life Cycle Approach

Hsiao-Fan Wang and Surendra M. Gupta, McGraw-Hill Professional, New York, NY, $130, 320 pages, July 2011, ISBN: 978-0-071-62283-7

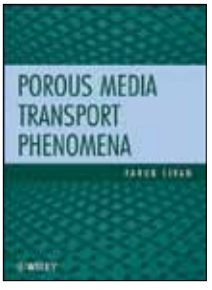
Increased awareness of issues related to energy and the environment is reflected in today's industrial development, as well as in government regulations and restrictions related to hazardous substances, waste policies, and eco-friendly product design.

Increasing interest in green engineering and green product management is a new trend, with many industries incorporating environmental factors into their supply chain management. This requires implementation of techniques to quantify the environmental impact on supply chains, and to identify opportunities for making improvements. Furthermore, the "reduce, redesign, remanufacture, and reuse" paradigm will require practitioners to utilize more analytical and scientific methodologies.

This comprehensive guide to implementing a green supply chain provides a stage-by-stage production methodology over the lifecycle of a product to ensure environmental compliance and economic objectives. In addition to exploring the basic concepts of green engineering and a green supply chain, the book covers the development of green product-information management and retrieval systems to facilitate the understanding and application of green product lifecycle assessment and promotion. Readers will also learn about the importance of green engineering and management with respect to enterprise competence, environmental protection, product sustainability, and legislation.

This book will be useful to practitioners, researchers, and students of engineering and management who are interested in an overview of a green supply chain as it relates to the lifecycle of a product.

Porous Media Transport Phenomena



Faruk Civan, John Wiley & Sons, Hoboken, NJ, $125, 488 pages, Aug. 2011, ISBN: 978-0-470-64995-4

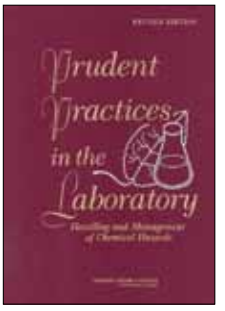
Many processes in nature and engineering applications occur in porous media — a field that encompasses a spectrum of materials, including rocks, biological tissues, and ceramics, to name just a few. The mathematical description of the flow and transport processes in such porous materials can be extremely complex.

This book takes a multidisciplinary approach to transport in porous media, offering a comprehensive review of the fundamentals, theories, and modeling of porous material and the behavior of fluids and chemical species in porous media. Focusing on practical applications while avoiding the complex math found in other books on the topic, this book also addresses mass, momentum, and energy conservation equations and their applications in engineered and natural porous media.

Methods for prediction, analysis, and description of commonly encountered porous-media processes are examined from a practical perspective, and well-established techniques for the modeling of porous media single- and multiphase processes are also described.

Designed as a text for graduate students, this reference will also be useful to researchers and practitioners, as it covers topics drawn from numerous engineering fields. The book includes study questions, a solutions manual for the exercises presented, and PowerPoint slides that accompany the text.

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards



National Research Council of the National Academies, National Academies Press, Washington, DC, $100, 360 pages, March 2011, ISBN: 978-0-309-13864-2

Thirty years ago, the National Research Council (NRC) produced two major reports on laboratory safety and laboratory waste disposal: *Prudent Practices for Handling Hazardous Chemicals in Laboratories* (1981) and *Prudent Practices for Disposal of Chemicals from Laboratories* (1983). These guidelines proved to be influential — not only on the safety culture in laboratory practice but also through their impact on the drafting of regulations. In the mid-1990s, the NRC's Board on Chemical Sciences and Technology initiated an update to these guidelines, to help laboratory workers, safety and waste-management personnel, and policymakers to respond to new regulations and knowledge.

This new volume revises and combines these two important sources of chemical safety guidelines.

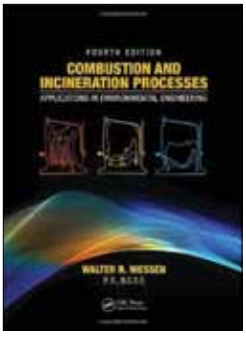
Developed by experts from academia and industry who specialize in such areas as chemical sciences, pollution pre-

vention, and laboratory safety, this comprehensive reference provides step-by-step planning procedures for the handling, storage, and disposal of chemicals. It also covers the current culture of laboratory safety and provides an updated guide to federal regulations. The book is organized around a recommended workflow protocol for experiments, outlining prudent practices designed to promote safety.

This revised edition includes an expanded chapter on chemical management and delves into new areas such as nanotechnology, laboratory security, and emergency planning. It also includes practical information on assessing hazards, managing chemicals, and disposing of wastes.

This book will be useful to research chemical engineers and chemists, technicians, safety officers, teachers, students — anyone who uses laboratory chemicals.

Combustion and Incineration Processes: Applications in Environmental Engineering, 4th Edition



Walter R. Niessen, CRC Press, Boca Raton, FL, $200, 800 pages, June 2010, ISBN: 978-1-439-80503-9

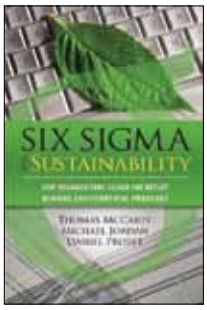
With landfills filling to capacity, interest in incineration- and conversion-based waste-management technologies continues to grow. Achievement of a true zero-waste society — *i.e.*, the eradication of landfills — will likely require thermal processing to economically extract the most value from waste residue after minimization, reuse, and recycling.

The updated fourth edition of this book incorporates the latest advances in the field, including the conversion technologies of the early 21st century. Detailing the changes that have occurred since the previous editions were published, this volume's expanded scope includes new details, data, and graphics related to municipal and industrial waste incineration and conversion systems, as well as refinements in associated pollution control — helping engineers, industrial firms, and academics to better understand and employ this complex and evolving interdisciplinary technology.

This reference covers all aspects of a waste-management facility, from waste receipt, handling, and storage to stack discharge and dispersion — exploring the design, operation, and evaluation of incineration and conversion (gasification) systems for hazardous and nonhazardous gaseous, liquid, biosolid, and solid wastes. The book also highlights breakthroughs in air pollution control, and discusses advances in materials handling, waste processing, refractory and materials engineering, combustion technology, and energy recovery to reduce and control toxins and pollutants in the environment.

An accompanying CD contains spreadsheets and computer applications for practical analysis of waste characteristics and combustion systems.

Six Sigma for Sustainability: How Organizations Design and Deploy Winning Environmental Programs



Thomas McCarty, Michael Jordan, and Daniel Probst, McGraw-Hill Professional, New York, NY, $50, 304 pages, July 2011, ISBN: 978-0-071-75244-2

One of the most complex problems that organizations face today is achieving both profitability and customer satisfaction in ways that are compatible with, and supportive of, environmental sustainability.

The Six Sigma methodology, as it has evolved over the past two decades, provides a framework for problem-solving and organizational leadership. Increasingly, business leaders are looking to Six Sigma techniques to deliver innovative programs that simultaneously reduce carbon emissions and provide cost savings.

This book shows practitioners how to apply Six Sigma methodologies to sustainability initiatives, explaining how to design, develop, and implement an environmental sustainability strategy using Six Sigma tools. Focusing on business rather than technology, the book explores how Six Sigma concepts such as program governance, project charters, transfer functions, measurement systems, risk assessment, and process design can shape environmentally sound business practices.

The book showcases real-world examples that demonstrate how specific problems in areas such as carbon emissions, energy conservation, materials recycling, water use, and finance can be solved using Six Sigma approaches. Examples in the text include case studies related to energy program design and solar energy.

The book also addresses factors such as developing the business case for investments in sustainability, sustainability measurement and reporting, the design of change-management strategies, and stakeholder management best practices to drive adoption of Six Sigma.