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ECOS 2012 The 25th International Conference on Efficiency, Cost, Optimization and Simulation of Energy Conversion Systems and Processes (Perugia, June 26th-June 29th, 2012)
Introduction to continuum damage mechanics

PATRICK ALEXIA

Thermochemical and Catalytic Conversion Technologies for Future Biorefineries Royal Society of Chemistry
Current Trends and Future Developments in (Bio-) Membranes: Recent Advances in Metallic Membranes presents recent developments in metallic membranes used in membrane reactors to save energy. It also offers a comprehensive review of the present state-of-the-art on the fabrication and design of metallic membranes and membrane reactors, considering various applications. This book focuses on the structure, preparation, characterization and applications of metallic membranes and membrane reactors, as well as transport mechanisms and simulation aspects. As recent research has focused on the development of metallic membranes and their applications, this book is an ideal reference on different production procedures and their use. Reviews metallic membranes research and applications Outlines the mechanisms of metallic membrane based processes Includes structure, preparation, characterization and properties of metallic membranes Highlights various applications of metallic membranes in energy production
Radiation Thermometry Academic Press

Ethanol: Science and Engineering reviews the most significant research findings in both ethanol production and utilization. The book's contents are divided into four parts, beginning with an explanation of the chemical reactions involved during the conversion of ethanol to more complex molecules. Other sections focus on various processes and their potential use, the modelling of various chemical processes, and finally, their economic and environmental impact. The book includes the most advanced production processes, new technologies, applications, and the economic role ethanol plays today. The book will be great for researchers and engineers in both academic and industry. The idea of using ethanol as a fuel is one of the most promising options in the arena of alternative fuels because of it versatile use as an intermediate for producing hydrogen via reforming reactions, direct fuel cells feed and/or its production from biomass, which is also considered a sustainable feedstock. Reviews ethanol production methods from biomass Discusses the potential of ethanol as a viable future fuel Includes hydrogen production methods using ethanol in catalytic reforming processes Outlines the various technologies based on ethanol Includes ethanol powered fuel cells

Damage Assessment, Reliability, and Life Prediction of Power Plant Components John Wiley & Sons

This book introduces readers to the fundamentals of artificial neural networks, with a special emphasis on evolutionary algorithms. At first, the book offers a literature review of several well-regarded evolutionary algorithms, including particle swarm and ant colony optimization, genetic algorithms and biogeography-based optimization. It then proposes evolutionary version of several types of neural networks such as feed forward neural networks, radial basis function networks, as well as recurrent neural networks and multi-later perceptron. Most of the challenges that have to be addressed when training artificial neural networks using evolutionary algorithms are discussed in detail. The book also demonstrates the application of the proposed algorithms for several purposes such as classification, clustering, approximation, and prediction problems. It provides a tutorial on how to design, adapt, and evaluate artificial neural networks as well, and includes source codes for most of the proposed techniques as supplementary materials.

Fossil Energy Update Newnes

Fischer-Tropsch Technology is a unique book for its state-of-the-art approach to Fischer Tropsch (FT) technology. This book provides an explanation of the basic principles and terminology that are required to understand the application of FT technology. It also contains comprehensive references to patents and previous publications. As the first publication to focus on theory and application, it is a contemporary reference source for students studying chemistry and chemical engineering. Researchers and engineers active in the development of FT technology will also find this book an invaluable source of information. * Is the first publication to cover the theory and application for modern Fischer Tropsch technology * Contains comprehensive knowledge on all aspects relevant to the application of Fischer Tropsch technology* No other publication looks at past, present and future applications

Mechanics Butterworth-Heinemann

The 8-volume set contains the Proceedings of the 25th ECOS

2012 International Conference, Perugia, Italy, June 26th to June 29th, 2012. ECOS is an acronym for Efficiency, Cost, Optimization and Simulation (of energy conversion systems and processes), summarizing the topics covered in ECOS: Thermodynamics, Heat and Mass Transfer, Exergy and Second Law Analysis, Process Integration and Heat Exchanger Networks, Fluid Dynamics and Power Plant Components, Fuel Cells, Simulation of Energy Conversion Systems, Renewable Energies, Thermo-Economic Analysis and Optimisation, Combustion, Chemical Reactors, Carbon Capture and Sequestration, Building/Urban/Complex Energy Systems, Water Desalination and Use of Water Resources, Energy Systems- Environmental and Sustainability Issues, System Operation/ Control/Diagnosis and Prognosis, Industrial Ecology.

Handbook of Materials Failure Analysis with Case Studies from the Chemicals, Concrete and Power Industries
Elsevier
Gasification involves the conversion of carbon sources without combustion to syngas, which can be used as a fuel itself or further processed to synthetic fuels. The technology provides a potentially more efficient means of energy generation than direct combustion. This book provides an overview of gasification science and engineering and the production of synthetic fuels by gasification from a variety of feedstocks. Part one introduces gasification, reviewing the scientific basis of the process and gasification engineering. Part two then addresses gasification and synthentic fuel production processes. Finally, chapters in part three outline the different applications of gasification, with chapters on the conversion of different types of feedstock. Examines the design of gasifiers, the preparation of feedstocks, and the economic, environmental and policy issues related to gasification Reviews gasification processes for liquid fuel production Outlines the different applications of gasification technology

Damage Mechanisms and Life Assessment of High Temperature Components Springer Science & Business Media
From Methane to Hydrogen-Making the Switch to a Cleaner Fuel Source The world's overdependence on fossil fuels has created environmental problems, such as air pollution and global warming, as well as political and economic unrest. With water as its only by-product and its availability in all parts of the world, hydrogen promises to be the next grea

Creep-- Characterization, Damage, and Life Assessments
Elsevier
Research efforts in the past decade have led to considerable advances in the concepts and methods of smart manufacturing. Smart Manufacturing: Applications and Case Studies includes information about the key applications of these new methods, as well as practitioners’ accounts of real-life applications and case studies. Written by thought leaders in the field from around the world, Smart Manufacturing: Applications and Case Studies is essential reading for graduate students, researchers, process engineers and managers. It is complemented by a companion book titled Smart Manufacturing: Concepts and Methods, which describes smart manufacturing methods in detail. Includes examples of applications of smart manufacturing in process industries Provides a thorough overview of the subject and practical examples of applications through well researched case studies Offers insights and accounts of first-hand experiences to

motivate further implementations of the key concepts of smart manufacturing

Hydrogen Fuel Springer Nature

Offers an introduction to the subject of radiation thermometry, focusing on sources of measurement error and giving advice on methods for minimizing or eliminating these errors. This title cover such topics as: blackbody radiation, emissivity, reflection errors, and atmospheric absorption and emission; and common radiation thermometers.

Hydrogen and Fuel Cells CRC Press

Containing a collection of 29 papers presented at the 2002 AIChE Ammonia Safety Symposium, this volume covers safe manufacture, transportation and storage of ammonia and other chemicals, as well as actual case histories and industry needs.

Energy Research Abstracts Springer

The aim of this book is to investigate and explain the rapid advances in the characterization of high temperature crack growth behaviour which have been made in recent years, with reference to industrial applications. Complicated mathematics has been minimized with the emphasis placed instead on finding solutions using simplified procedures without the need for complex numerical analysis.

Life Extension and Assessment ASM International

This book will attempt to provide an account of knowledge on biomass available for biomass-based biorefineries. Its focuses on understanding the recalcitrance of biomass and how it limits the overall conversion efficiency. It also gives an insight what are different conventional approaches available for pretreatment and hydrolysis of the biomass. The chapters deals with highlights how enzymes can be a powerhouse and play pioneering roles in biomass valorization. The book will also throw light on how technical aspects of thermochemical conversion strategies such as pyrolysis, gasification, organosolv methods for the generation of value-added materials such as high-quality bio-oil, biochars, and biobased chemicals. These high-value compounds can be put to widespread application in biofuel, biocatalyst, waste bioremediation (heavy metal removal), air purification and effluent treatment applications. The book will provide literature on the limitations of already existing technologies and provide prospects of each technology. This book is of interest to teachers, researchers, bioenergy scientists, capacity builders, and policymakers. Also, the book serves as additional reading material for undergraduate and graduate students of energy studies, chemical engineering, biotechnology, and environmental sciences. National and international energy scientists and policymakers will also find this to be a useful read.

Solutions to Equipment Failures SPIE Press

Modern engineering materials subjected to unfavorable mechanical and environmental conditions decrease in strength due to the accumulation of microstructural changes. For example, considering damage in metals we can mention creep damage, ductile plastic damage, embrittlement of steels and fatigue damage. To properly estimate the value of damage when designing reliable structures it is necessary to formulate the damage phenomenon in terms of mechanics. Then it is possible to analyse various engineering problems using analytical and computational techniques. During the last two decades the basic principles of continuum damage mechanics were formulated and

some special problems were solved. Many scientific papers were published and several conferences on damage mechanics took place. Now continuum damage mechanics is rapidly developing branch of fracture mechanics. This book is probably the first one on the subject; it contains a sys tematic description of the basic aspects of damage mechanics and some of its applications. In general, a theoretical description of damage can be rather compli cated. The experiments in this field are difficult (especially under multiax ial stress and non-proportional loading). Therefore, experimental data, as a rule, are scarce. Determination of functions and constants, which play a role in the complex variants of the theory, from available experimental data is often practically impossible. ix L.M. Kachanov The problems of damage mechanics are mainly engineering ones. Therefore, the author tries to avoid superfluous mathematical formalism. Some more details of the book's subject can be found in the list of con tents.

Fuel Cell Science, Engineering and Technology--2004 Elsevier

The aim of this major reference work is to provide a first point of entry to the literature for the researchers in any field relating to structural integrity in the form of a definitive research/reference tool which links the various sub-disciplines that comprise the whole of structural integrity. Special emphasis will be given to the interaction between mechanics and materials and structural integrity applications. Because of the interdisciplinary and applied nature of the work, it will be of interest to mechanical engineers and materials scientists from both academic and industrial backgrounds including bioengineering, interface engineering and nanotechnology. The scope of this work encompasses, but is not restricted to: fracture mechanics, fatigue, creep, materials, dynamics, environmental degradation, numerical methods, failure mechanisms and damage mechanics, interfacial fracture and nano-technology, structural analysis, surface behaviour and heart valves. The structures under consideration include: pressure vessels and piping, off-shore structures, gas installations and pipelines, chemical plants, aircraft, railways, bridges, plates and shells, electronic circuits, interfaces, nanotechnology, artificial organs, biomaterial prostheses, cast structures, mining... and more. Case studies will form an integral part of the work.

Hydrogen Energy Elsevier

This book introduces chemical engineering students to key concepts, strategies, and evaluation methods in sustainable process engineering. The book is intended to supplement chemical engineering texts in fundamentals and design, rather than replace them. The key objectives of the book are to widen system boundaries beyond a process plant to include utility supplies, interconnected plants, wider industry sectors, and entire product life cycles; identify waste and its sources in process and utility systems and adopt waste minimization strategies; broaden evaluation to include technical, economic, safety, environmental, social, and sustainability criteria and to integrate the assessments; and broaden the engineering horizon to incorporate planning, development, design, and operations. Case examples are integrated with chapter topics throughout, and defined problems that reflect current industry challenges are provided. Contexts include electricity generation, waste sulfuric acid minimization, petroleum fuel desulfurization, and byproduct hydrogen utilization.

Ammonia Plant Safety and Related Facilities Elsevier
This book will provide the latest global perspective on the role and value of carbon capture and storage (CCS) in delivering temperature targets and reducing the impact of global warming. As well as providing a comprehensive, up-to-date overview of the major sources of carbon dioxide emission and negative emissions technologies, the book also discusses technical, economic and political issues associated with CCS along with strategies to enable commercialisation.
Applied Mechanics Reviews Springer Nature
Handbook of Materials Failure Analysis: With Case Studies from the Chemicals, Concrete and Power Industries provides an in-depth examination of materials failure in specific situations, a vital component in both developing and engineering new solutions. This handbook covers analysis of materials failure in the chemical, power, and structures arenas, where the failure of a single component can result in devastating consequences and costs. Material defects, mechanical failure as a result of improper design, corrosion, surface fracture, and other failure mechanisms are described in the context of real world case studies involving steam generators, boiler tubes, gas turbine blades, welded structures, chemical conversion reactors and more. This book is an indispensable reference for engineers and scientists studying the mechanisms of failure in these fields. Introduces readers to modern analytical techniques in materials failure analysis Combines foundational knowledge with current research on the latest developments and innovations in the field Includes many compelling case studies of materials failure in chemical processing plants, concrete structures, and power generation systems
Carbon Capture and Storage BoD – Books on Demand
Failure Analysis - Structural Health Monitoring of Structure and Infrastructure Components is a collection of chapters written by academicians, researchers, and practicing engineers from all over the world. The chapters focus on some developments as well as problems in structural health monitoring (SHM) in civil engineering structures and infrastructures. The book covers a variety of multidisciplinary topics, including SHM, risk analysis, seismic analysis, and various modeling and simulation methodologies. This book is an excellent resource for undergraduate and postgraduate students, academics, and researchers across a wide variety of engineering disciplines, as well as for practicing engineers and other professionals in the engineering industry.
Fitness-for-service and Decisions for Petroleum and Chemical Equipment ASM International
In a multidisciplinary field such as energy, Hydrogen and Fuel Cells stands out by covering the entire width of hydrogen production and usage technologies, giving detailed descriptions of not just one but the range of very different fuel cells that have been developed or are under development. In one volume, respected experts Bent Sorensen and Giuseppe Spazzafumo provide all the basic scientific theory underlying hydrogen and fuel cell technologies, but at the same time present applications and sustainable integration into society in a way accessible to a broad range of people working in this field, whether in technical, economic or management roles. The third edition reflects both recently emerged technologies and the market penetration of the

most promising technologies, and it gives an appraisal of how far fuel cell technology may go in the future, considering current challenges and economic trends. This new edition has updated and expanded content on hydrogen storage and transmission, molten carbonate fuel cells, PEM fuel cells, solid oxide fuel cells, biofuel cells, including microbial fuel cells, applications in transportation and power plants, future scenarios and life-cycle assessment. It is ideal for researchers and professionals in the field of energy, and renewable energy in particular, both in academia and industry. It is also useful to lecturers and graduate students in engineering, physics, and environmental sciences, as well as professionals involved in energy or environmental regulation and policy. Gain thorough understanding of the science and applications of hydrogen and a range of different fuel cells, including economic and social aspects of the field Updated sections include hydrogen storage and transportation, biofuel cells, PEM and solid oxide fuel cells, applications in transportation and large scale power generation, and life-cycle assessment

Smart Manufacturing Firenze University Press

HYDROGEN ENERGY Comprehensive resource exploring integrated hydrogen technology with guidance for developing practical operating systems Hydrogen Energy presents all-inclusive knowledge on hydrogen production and storage to enable readers to design guidelines for its production, storage, and applications, addressing the recent renewed interest in hydrogen energy to manage the global energy crisis and discussing the electrochemical potential of hydrogen in transportation and fuel cells. Written by a highly qualified author, Hydrogen Energy explores sample topics such as: Essentials of hydrogen energy, such as its occurrence, physico-chemical properties, production, transmission, delivery, storage, and utilization Technology of hydrogen utilization in the land transport sector, such as automobiles, as well as other modes of transport, like marine and air Combustion characteristics and environmental pollution features, internal combustion engines, and fuel cells Guidelines to design prototype systems, covering their safety, hydrogen induced damages and life cycle analysis Providing in-depth coverage of the subject, Hydrogen Energy is an ideal resource for researchers and professionals working towards developing time-bound goal-oriented hydrogen-based programs in the chemical, automobile, power, and process engineering sectors.

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