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New Materials, Applications and Processes - Jian Min Zeng 2011-11-22

The 461 peer-reviewed papers presented in this volume are grouped into 14 chapters: Non-Ferrous Metallic Materials, Iron and Steel, Composites, Micro/Nano-Materials, Ceramics, Optical/Electronic/Magnetic Materials, New Functional Materials, Environmentally Friendly Materials, New Energy Materials, Biomaterials, Materials Forming and Machining, Physics and Numerical Simulation of Material Processes, Surface Engineering/Coatings, and Mechanical Behavior and Fracture. The voluminous contents function as a handbook guide to these topics. Volume is indexed by Thomson Reuters CPCI-S (WoS).

Proceedings of the 9th International Symposium on Superalloy 718 & Derivatives: Energy, Aerospace, and Industrial Applications - Eric Ott 2018-05-12

This technical meeting will focus on Alloy 718 and Superalloys in this class relative to alloy and process development, production, product applications, trends and the development of advanced modeling tools. The symposium provides an opportunity for authors to present technical advancements relative to a broad spectrum of areas while assessing their impact on related fields associated with this critical alloy group. There are continuing innovations relative to these alloys as well as novel processing techniques which continue to extend applications in very challenging environments ranging from corrosion resistance in the deep sea to high-stressed space applications.

1995 Federal Research and Development Program in Materials Science and Technology - National Science and Technology Council (U.S.). Materials Technology Subcommittee 1995

Energy Research Abstracts - 1991-06

Oxidation Mechanisms of Materials for Heat Exchanging Components in CO₂/H₂O-containing Gases Relevant to Oxy-fuel Environments - Tomasz Olszewski 2012

New Alloys for Pressure Vessels and Piping - American Society of Mechanical Engineers. Pressure Vessels and Piping Division 1990

Creep-Resistant Steels - Fujio Abe 2008-03-14

Creep-resistant steels are widely used in the petroleum, chemical and power generation industries. Creep-resistant steels must be reliable over very long periods of time at high temperatures and in severe environments. Understanding and improving long-term creep strength is essential for safe operation of plant and equipment. This book provides an authoritative summary of key research in this important area. The first part of the book describes the specifications and manufacture of creep-resistant steels. Part two covers the behaviour of creep-resistant steels and methods for strengthening them. The final group of chapters analyses applications in such areas as turbines and nuclear reactors. With its distinguished editors and international team of contributors, Creep-resistant steels is a valuable reference for the power generation, petrochemical and other industries which use high strength steels at elevated temperatures.

Describes the specifications and manufacture of creep-resistant steels Strengthening methods are discussed in detail Different applications are analysed including turbines and nuclear reactors

THERMEC 2011 - T. Chandra 2012-01-03

Volume is indexed by Thomson Reuters CPCI-S (WoS). These are the proceedings of the 7th International Conference on Processing and Manufacturing of Advanced Materials - THERMEC 2011 - which was held during the 1-5 August 2011 in Quebec City, Canada. 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 and smart/intelligent materials. The contents are thus and excellent and up-to-date guide to these subjects.

Fossil Energy Update - 1976

Advances in Materials Technology for Fossil Power Plants - Ramaswamy Viswanathan 2005-01-01

Advanced Materials Innovation - Sanford L. Moskowitz 2016-09-13

Through detailed case studies of the most important advanced material creations of the latter 20th and early 21st century, the author explores the role of the field of advanced materials in the technological and economic activity today, with implications to the innovation process in general. A comprehensive study that encompasses the three major categories of advanced material technologies, i.e., Structural Materials (metals and polymers), Functional Materials (transistor, microchip and semiconductor laser) and Hybrid and New Forms of Matter (liquid crystals and nanomaterials). Extensive use of primary sources, including unpublished interviews with the scientists, engineers, and entrepreneurs on the front lines of advanced materials creation Original approach to case study narrative, emphasizing interaction between the advanced material process, perceived risk and directing and accelerating breakthrough technology Creep Deformation and Fracture, Design, and Life Extension - Rajiv S. Mishra 2005

Advances in Materials Science for Environmental and Nuclear Technology II - S. K. Sundaram 2011-08-04

This book contains 29 papers from the Clean Energy: Fuel Cells, Batteries, Renewables; Green Technologies for Materials Manufacturing and Processing II; and Materials Solutions for the Nuclear Renaissance symposia held during the 2010 Materials Science and Technology (MS&T'10) meeting, October 17-21, 2010, Houston, Texas. Topics include Batteries; Corrosion and Materials Degradation; Fuel Cells & Electrochemistry; Fossil Energy Materials; Solar Energy; Waste Minimization; Green Manufacturing and Materials Processing; Immobilization of Nuclear Wastes; Irradiation and Corrosion Effects; and Materials Performance in Extreme Environments.

New structural materials technologies : opportunities for the use of advanced ceramics and composites. -

Thermal Power Plants - Mohammad Rasul 2012-01-13

Thermal power plants are one of the most important process industries for engineering professionals. Over the past few decades, the power sector has been facing a number of critical issues. However, the most fundamental challenge is meeting the growing power demand in sustainable and efficient ways. Practicing power plant engineers not only look after operation and maintenance of the plant, but also look after a range of activities, including research and development, starting from power generation, to environmental assessment of power plants. The book *Thermal Power Plants* covers features, operational issues, advantages, and limitations of power plants, as well as benefits of renewable power generation. It also introduces thermal performance analysis, fuel combustion issues, performance monitoring and modelling, plants health monitoring, including component fault diagnosis and prognosis, functional analysis, economics of plant operation and maintenance, and environmental aspects. This book addresses several issues related to both coal fired and gas turbine power plants. The book is suitable for both undergraduate and research for higher degree students, and of course, for practicing power plant engineers.

Advanced Power Plant Materials, Design and Technology - Dermot Roddy 2010-05-24

Fossil-fuel power plants account for the majority of worldwide power generation. Increasing global energy demands, coupled with issues of ageing and inefficient power plants, have led to new power plant construction programmes. As cheaper fossil fuel resources are exhausted and emissions criteria are tightened, utilities are turning to power plants designed with performance in mind to satisfy requirements for improved capacity, efficiency, and environmental characteristics. *Advanced power plant materials, design and technology* provides a comprehensive reference on the state of the art of gas-fired and coal-fired power plants, their major components and performance improvement options. Part one critically reviews advanced power plant designs which target both higher efficiency and flexible operation, including reviews of combined cycle technology and materials performance issues. Part two reviews major plant components for improved operation, including advanced membrane technology for both hydrogen (H₂) and carbon dioxide (CO₂) separation, as well as flue gas handling technologies for improved emissions control of sulphur oxides (SO_x), nitrogen oxides (NO_x), mercury, ash and particulates. The section concludes with coverage of high-temperature sensors, and monitoring and control technology that are essential to power plant operation and performance optimisation. Part three begins with coverage of low-rank coal upgrading and biomass resource utilisation for improved power plant fuel flexibility. Routes to improve the environmental impact are also reviewed, with chapters detailing the integration of underground coal gasification and the application of carbon dioxide (CO₂) capture and storage. Finally, improved generation performance is reviewed with coverage of syngas and hydrogen (H₂) production from fossil-fuel feedstocks. With its distinguished international team of contributors, *Advanced power plant materials, design and technology* is a standard reference for all power plant engineers and operators, as well as to academics and researchers in this field. Provides a comprehensive reference on the state-of-the-art gas-fired and coal-fired power plants, their major components and performance improvement options Examines major plant components for improved operation as well as flue gas handling technologies for improved emissions control Routes to improve environmental impact are discussed with chapters detailing the integration of underground coal gasification

Energy Materials 2014 - The Minerals, Metals & Materials Society (TMS) 2017-03-16

Trends in Welding Research 2012: Proceedings of the 9th International Conference - Tarasankar DebRoy, Stan A. David, John N. DuPont, Toshihiko Koseki, Harry K. Bhadeshia 2013-03-01

The Trends conference attracts the world's leading welding researchers. Topics covered in this volume include friction stir welding, sensing, control and automation, microstructure and properties, welding processes, procedures and consumables, weldability, modeling, phase transformations, residual stress and distortion, physical processes in welding, and properties and structural integrity of weldments.

Coal Power Plant Materials and Life Assessment - A. Shibli 2014-07-24

Due to their continuing role in electricity generation, it is important that coal power plants operate as efficiently and cleanly as possible. *Coal Power Plant Materials and Life Assessment* reviews the materials used in coal plants, and how they can be assessed and managed to optimize plant operation. Part I considers the structural alloys used in coal plants. Part II then reviews performance modelling and life

assessment techniques, explains the inspection and life-management approaches that can be adopted to optimize long term plant operation, and considers the technical and economic issues involved in meeting variable energy demands. Summarizes key research on coal-fired power plant materials, their behavior under operational loads, and approaches to life assessment and defect management Details the range of structural alloys used in coal power plants, and the life assessment techniques applicable to defect-free components under operational loads Reviews the life assessment techniques applicable to components containing defects and the approaches that can be adopted to optimize plant operation and new plant and component design

New Structural Materials Technologies - 1986

Proceedings of the 2014 Energy Materials Conference - The Minerals, Metals & Materials Society (TMS) 2015-04-15

This DVD contains a collection of papers presented at EnergyMaterials 2014, a conference organized jointly by The Chinese Society for Metals (CSM) and The Minerals, Metals & Materials Society (TMS), and held November 4-6, 2014, in Xi'an, Shaanxi Province, China. With the rapid growth of the world's energy production and consumption, the important role of energy materials has achieved worldwide acknowledgement. Material producers and consumers constantly seek the possibility of increasing strength, improving fabrication and service performance, simplifying processes, and reducing costs. Energy Materials 2014 has provided a forum for academics, researchers, and engineers around the world to exchange state-of-the-art development and information on issues related to energy materials. The papers on the DVD are organized around the following topics: Materials for Coal-Based Systems Materials for Gas Turbine Systems Materials for Nuclear Systems Materials for Oil and Gas Materials for Pressure Vessels

Fuelling the Future - A. Mendez-Vilas 2012-12-01

"This book contains a selection of papers presented at The Energy & Materials Research Conference (EMR2012), which was held in Torremolinos, Málaga (Spain), during June 20th-22nd 2012."--p. ix.

Joint EPRI - 123HiMAT International Conference on Advances in High-Temperature Materials - J. Shingledecker 2019-10-01

Proceedings from: EPRI's 9th International Conference on Advances in Materials Technology for Fossil Power Plants and the 2nd International 123HiMAT Conference on High-Temperature Materials *Materials for Ultra-Supercritical and Advanced Ultra-Supercritical Power Plants* - Augusto Di Gianfrancesco 2016-09-08

Materials for Ultra-Supercritical and Advanced Ultra-Supercritical Power Plants provides researchers in academia and industry with an essential overview of the stronger high-temperature materials required for key process components, such as membrane wall tubes, high-pressure steam piping and headers, superheater tubes, forged rotors, cast components, and bolting and blading for steam turbines in USC power plants. Advanced materials for future advanced ultra-supercritical power plants, such as superalloys, new martensitic and austenitic steels, are also addressed. Chapters on international research directions complete the volume. The transition from conventional subcritical to supercritical thermal power plants greatly increased power generation efficiency. Now the introductions of the ultra-supercritical (USC) and, in the near future, advanced ultra-supercritical (A-USC) designs are further efforts to reduce fossil fuel consumption in power plants and the associated carbon dioxide emissions. The higher operating temperatures and pressures found in these new plant types, however, necessitate the use of advanced materials. Provides researchers in academia and industry with an authoritative and systematic overview of the stronger high-temperature materials required for both ultra-supercritical and advanced ultra-supercritical power plants Covers materials for critical components in ultra-supercritical power plants, such as boilers, rotors, and turbine blades Addresses advanced materials for future advanced ultra-supercritical power plants, such as superalloys, new martensitic and austenitic steels Includes chapters on technologies for welding technologies

Proceedings: Creep & Fracture in High Temperature Components - I. A. Shibli 2009

A compendium of European and worldwide research investigating creep, fatigue and failure behaviors in metals under high-temperature and other service stresses. It helps set the standards for coordinating creep

data and for maintaining defect-free quality in high-temperature metals and metal-based weldments.

Advanced Materials Science & Technology in China: A Roadmap to 2050 - Ke Lu 2010-08-09

As one of the eighteen field-specific reports comprising the comprehensive scope of the strategic general report of the Chinese Academy of Sciences, this sub-report addresses long-range planning for developing science and technology in the field of advanced materials science. They each craft a roadmap for their sphere of development to 2050. In their entirety, the general and sub-group reports analyze the evolution and laws governing the development of science and technology, describe the decisive impact of science and technology on the modernization process, predict that the world is on the eve of an impending S&T revolution, and call for China to be fully prepared for this new round of S&T advancement. Based on the detailed study of the demands on S&T innovation in China's modernization, the reports draw a framework for eight basic and strategic systems of socio-economic development with the support of science and technology, work out China's S&T roadmaps for the relevant eight basic and strategic systems in line with China's reality, further detail S&T initiatives of strategic importance to China's modernization, and provide S&T decision-makers with comprehensive consultations for the development of S&T innovation consistent with China's reality. Supported by illustrations and tables of data, the reports provide researchers, government officials and entrepreneurs with guidance concerning research directions, the planning process, and investment. Founded in 1949, the Chinese Academy of Sciences is the nation's highest academic institution in natural sciences. Its major responsibilities are to conduct research in basic and technological sciences, to undertake nationwide integrated surveys on natural resources and ecological environment, to provide the country with scientific data and consultations for government's decision-making, to undertake government-assigned projects with regard to key S&T problems in the process of socio-economic development, to initiate personnel training, and to promote China's high-tech enterprises through its active engagement in these areas.

Advances in Materials Technology for Fossil Power Plants - Ramaswamy Viswanathan 2008

An October 2007 conference allowed scientists and engineers from around the world to exchange information on advanced, high-efficiency coal power plants. Papers from the conference are presented here, in sections on boilers, turbines, oxidation, creep/life management, welding, and oxy fuel. Some specific topics include materials solutions for advanced steam power plants, consideration of weld behavior in the design of high temperature components, nickel alloys for high efficiency fossil power plants, and material development and mechanical integrity analysis for advanced steam turbines. Other subjects are ferritic and austenitic grades for a new generation of steam power plants, the impact of steam-side oxidation on boiler heat-exchanger tube design, and oxy-combustion technology for utility coal-fired boilers.

Advances in Materials Technology for Fossil Power Plants - D. Gandy and J. Shingledecker 2014-01-01

Conference proceedings covering the latest technology developments for fossil fuel power plants, including nickel-based alloys for advanced ultrasupercritical power plants, materials for turbines, oxidation and corrosion, welding and weld performance, new alloys concepts, and creep and general topics.

Materials for Ultra-Supercritical and Advanced Ultra-Supercritical Power Plants - Augusto Di

Gianfrancesco 2016-09-01

Materials for Ultra-Supercritical and Advanced Ultra-Supercritical Power Plants provides researchers in academia and industry with an essential overview of the stronger high-temperature materials required for key process components, such as membrane wall tubes, high-pressure steam piping and headers, superheater tubes, forged rotors, cast components, and bolting and blading for steam turbines in USC power plants. Advanced materials for future advanced ultra-supercritical power plants, such as superalloys, new martensitic and austenitic steels, are also addressed. Chapters on international research directions complete the volume. The transition from conventional subcritical to supercritical thermal power plants greatly increased power generation efficiency. Now the introductions of the ultra-supercritical (USC) and, in the near future, advanced ultra-supercritical (A-USC) designs are further efforts to reduce fossil fuel consumption in power plants and the associated carbon dioxide emissions. The higher operating temperatures and pressures found in these new plant types, however, necessitate the use of advanced materials. Provides researchers in academia and industry with an authoritative and systematic overview of the stronger high-temperature materials required for both ultra-supercritical and advanced ultra-

supercritical power plants Covers materials for critical components in ultra-supercritical power plants, such as boilers, rotors, and turbine blades Addresses advanced materials for future advanced ultra-supercritical power plants, such as superalloys, new martensitic and austenitic steels Includes chapters on technologies for welding technologies

Creep and Fracture in High Temperature Components - European Creep Collaborative Committee 2005

Provides information from around the world on creep in multiple high-temperature metals, alloys, and advanced materials.

Proceedings of the ASME Pressure Vessels and Piping Conference--2006: Design and analysis - 2007

5th FORUM ON NEW MATERIALS - Pietro Vincenzini 2010-10-27

The 49 peer-reviewed papers collected here together offer a plenitude of up-to-date information on [Advanced Fossil Fuel Energy Technologies, Hydrogen Production and Storage, Fuel Cells, Electrochemical Energy Storage Systems]. The papers are conveniently arranged into MATERIALS FOR ADVANCED FOSSIL FUEL ENERGY TECHNOLOGIES, MATERIALS IN HYDROGEN PRODUCTION AND STORAGE, Hydrogen Production, Hydrogen Storage, FUEL CELLS: MATERIALS AND TECHNOLOGY CHALLENGES, MATERIALS IN ELECTROCHEMICAL ENERGY STORAGE SYSTEMS.

Department of the Interior and Related Agencies Appropriations for 2004: Testimony of Members of Congress - United States. Congress. House. Committee on Appropriations. Subcommittee on Department of the Interior and Related Agencies 2003

ASM Handbook - ASM International. Handbook Committee 1990

These volumes cover the properties, processing, and applications of metals and nonmetallic engineering materials. They are designed to provide the authoritative information and data necessary for the appropriate selection of materials to meet critical design and performance criteria.

Advances in Materials Technology for Fossil Power Plants - 2011-01-01

Materials & Components in Fossil Energy Applications -

Energy Resources and Systems - Tushar Ghosh 2009-06-17

In the lifetimes of the authors, the world and especially the United States have received three significant "wake-up calls" on energy production and consumption. The first of these occurred on October 15, 1973 when the Yom Kippur War began with an attack by Syria and Egypt on Israel. The United States and many western countries supported Israel. Because of the western support of Israel, several Arab oil exporting nations imposed an oil embargo on the west. These nations withheld five million barrels of oil per day. Other countries made up about one million barrels of oil per day but the net loss of four million barrels of oil production per day extended through March of 1974. This represented 7% of the free world's (i. e. , excluding the USSR) oil production. In 1972 the price of crude oil was about \$3. 00 per barrel and by the end of 1974 the price of oil had risen by a factor of 4 to over \$12. 00. This resulted in one of the worst recessions in the post World War II era. As a result, there was a movement in the United States to become energy independent. At that time the United States imported about one third of its oil (about five million barrels per day). After the embargo was lifted, the world chose to ignore the "wake-up call" and went on with business as usual.

Ultra-Supercritical Coal Power Plants - Dongke Zhang FTSE 2013-08-31

The continued use of coal as a means of generating electricity and an increasing demand for cleaner, more efficient energy production has led to advances in power plant technology. Ultra-supercritical coal power plants reviews the engineering, operation, materials and performance of ultra-supercritical coal power plants. Following a chapter introducing advanced and ultra-supercritical coal power plants, part one goes on to explore the operating environments, materials and engineering of ultra-supercritical coal power plants. Chapters discuss the impacts of steam conditions on plant materials and operation, fuel considerations and burner design, and materials and design for boilers working under supercritical steam

conditions. Chapters in part two focus on improving ultra-supercritical coal power plant performance and operability. Ash fouling, deposition and slagging in ultra-supercritical coal power plants are highlighted along with pollution control measures and the estimation, management and extension of the life of ultra-supercritical power plants. Further chapters provide an economic and engineering analysis of a 700°C advanced ultra-supercritical pulverised coal power plant and discuss CO2 capture-ready ultra-supercritical coal power plants. Ultra-supercritical coal power plants is a comprehensive technical reference for power plant operators and engineers, high-temperature materials scientists, professionals in the power industry who require an understanding of ultra-supercritical coal power plants and researchers and academics interested in the field. Provides a comprehensive reference on the developments, materials, design and operation of ultra-supercritical power plant. Considers the degradation issues affecting this type of plant, as well as emissions control and CO2 capture technology; improved plant controls critical to improved

operation and environmental performance. Contains operational assessments for plant safety, plant life management, and plant economics.
Energy Research Abstracts - 1982

Proceedings of the 8th Pacific Rim International Conference on Advanced Materials and Processing (PRICM-8) - FernD.S. Marquis 2017-03-21

PRICM-8 features the most prominent and largest-scale interactions in advanced materials and processing in the Pacific Rim region. The conference is unique in its intrinsic nature and architecture which crosses many traditional discipline and cultural boundaries. This is a comprehensive collection of papers from the 15 symposia presented at this event.