

Bulk Density Averages Key Technology

The Light Metals symposia are a key part of the TMS Annual Meeting & Exhibition, presenting the most recent developments, discoveries, and practices in primary aluminum science and technology. Publishing the proceedings from these important symposia, the Light Metals volume has become the definitive reference in the field of aluminum production and related light metal technologies. The 2014 collection includes papers from the following symposia:

- Alumina and Bauxite
- Aluminum Alloys: Fabrication, Characterization and Applications
- Aluminum Processing
- Aluminum Reduction Technology
- Cast Shop for Aluminum Production
- Electrode Technology for Aluminum Production
- Light-metal Matrix (Nano)-composites

ONE OF A FOUR-BOOK COLLECTION SPOTLIGHTING CLASSIC ARTICLES Landmark research findings and reviews in aluminum reduction technology Highlighting some of the most important findings and insights reported over the past five decades, this volume features many of the best original research papers and reviews on aluminum reduction technology published from 1963 to 2011. Papers have been organized into seven themes: 1. Fundamentals 2. Modeling 3. Design 4. Operations 5. Control 6. Environmental 7. Alternative processes The first six themes deal with conventional Hall-Héroult electrolytic reduction technology, whereas the last theme features papers dedicated to nonconventional processes. Each section begins with a brief introduction and ends with a list of recommended articles for further reading, enabling researchers to explore each subject in greater depth. The papers for this volume were selected from among some 1,500 Light Metals articles. Selection was based on a rigorous review process. Among the papers, readers will find breakthroughs in science as well as papers that have had a major impact on technology. In addition, there are expert reviews summarizing our understanding of key topics at the time of publication. From basic research to advanced applications, the articles published in this volume collectively represent a complete overview of aluminum reduction technology. It will enable students, scientists, and engineers to trace the history of aluminum reduction technology and bring themselves up to date with the current state of the technology.

In 2018, the International Symposium on Nanogeoscience was held in Guiyang, China. Scholars from around the globe gathered to discuss recent progress and development trends in various aspects of nanogeoscience, including nanomineralogy. Nanomineralogy, an important aspect of nanogeoscience, focuses on the composition, structure, and physical and chemical properties of nanoscale minerals and their interrelations with other Earth critical components. To give a sampling of the latest progress in nanomineralogy and related fields, we offer this Special Issue, which describes a full range of recent nanomineralogic achievements relating to everything from nanominerals and geochemistry, mineral nanostructures, and nanomineral deformation, to nanopores in oil and gas reservoirs, nanomineral deposits, and nanomineral material. Today, nanomineralogy faces a new strategic opportunity as well as a revolutionary challenge. We thus present this special nanomineralogy-focused issue of Minerals with the aim of encouraging our colleagues to familiarize themselves with current developments, trends, and directions in nanomineralogy, enabling an understanding of the potential of the field as a whole. We look forward to developing further scientific research and cooperation in nanomineralogy, hoping thereby to attract and guide young scholars to participate in this field.

This book presents peer-reviewed papers based on the oral and poster presentations during the 5th International Conference on Renewable Energy Sources, which was held from June 20 to 22, 2018 in Krynica, Poland. The scope of the conference included a wide range of topics in renewable energy technology, with a major focus on biomass, solar energy and geothermal energy, but also extending to heat pumps, fuel cells, wind energy, energy storage, and the

modelling and optimization of renewable energy systems. This edition of the conference had a special focus on the role of renewable energy in the reduction of air pollution in the Eastern European region. Traditionally this conference is a unique occasion for gathering Polish and international researchers' perspectives on renewable energy sources, and furthermore of balancing them against governmental policy considerations. Accordingly, the conference offered also panels to discuss best practices and solutions with local entrepreneurs and federal government bodies. The meeting attracts not only scientist but also industry representatives as well as local and federal government personnel. In 2018, the conference was organized by the University of Agriculture in Krakow in cooperation with AGH University of Science and Technology (Krakow), University of Žilina, Silesian University of Technology, International Commission of Agricultural and Biosystems Engineering (CIGR) and Polish Society of Agricultural Engineering. Honorary auspices were given by the Ministry of Science and Higher Education Republic of Poland, Rector of the University of Agriculture in Krakow and Rector of the AGH University of Science and Technology.

Essential Readings in Light Metals, Volume 2, Aluminum Reduction Technology Springer
Discovered by Edward G. Acheson about 1890, silicon carbide is one of the oldest materials and also a new material. It occurs naturally in meteorites, but in very small amounts and is not in a useable state as an industrial material. For industrial requirements, large amounts of silicon carbide must be synthesized by solid state reactions at high temperatures. Silicon carbide has been used for grinding and as an abrasive material since its discovery. During World War II, silicon carbide was used as a heating element; however, it was difficult to obtain high density sintered silicon carbide bodies. In 1974, S. Prochazka reported that the addition of small amounts of boron compounds and carbide were effective in the sintering process to obtain high density. It was then possible to produce high density sintered bodies by pressureless sintering methods in ordinary atmosphere. Since this development, silicon carbide has received great attention as one of the high temperature structural ceramic materials. Since the 1970s, many research papers have appeared which report studies of silicon carbide and silicon nitride for structural ceramics.

The 2014 International Conference on Water Resource and Environmental Protection [WREP2014] aims to bring researchers, engineers, and students to the areas of Water Resource and Environmental Protection. WREP2014 features unique mixed topics of Water Resource and Environmental Protection in the context of building healthier ecology and environment. The conference will provide a forum for sharing experiences and original research contributions on those topics. Researchers and practitioners are invited to submit their contributions to WREP2014. This proceeding tends to collect the up-to-date, comprehensive and worldwide state-of-art knowledge on water resource and environmental protection. All of accepted papers were subjected to strict peer-reviewing by 2–4 expert referees. The papers have been selected for this proceedings based on originality, significance, and clarity for the purpose of the conference. The selected papers and additional late-breaking contributions to be presented will make an exciting technical program on WREP2014 conference. The conference program is extremely rich, featuring high-impact presentation. We hope this conference will not only provide the participants a broad overview of the latest research results on water resource and environmental protection, but also provide the participants a significant platform to build academic connections.

The pendulum is perhaps the simplest experimental devices ever constructed, and yet

for all its simplicity it has historically enabled scientists to both investigate and enumerate gravity; the fundamental force that shapes the very universe. The pendulum has also allowed astronomers and geologists to measure the motion, mass and distribution of matter within the Earth, and its stately swing is at the very heartbeat of time. This book explores the many applications of the pendulum, from its employment as a fundamental experimental device, such as in the Cavendish torsion balance for measuring the universal gravitational constant, to its everyday, practical use in geology, astronomy and horology.

Profiles 156 demonstration, emerging, and monitoring and measurement technologies being evaluated under the SITE Program.

The heart of the contemporary argument on climate change and energy transition focuses on how energy supply should be decarbonized to mitigate greenhouse gas emissions. This book proposes an alternative approach. *The Age of Fire Is Over: A New Approach to the Energy Transition* finds that energy transitions are not driven by supply-side driven transformations but rather by evolutions in demand patterns. Exploring the potential of recently emerged key technologies, *The Age of Fire Is Over* argues that the so-called Energy Transition has not yet started. In the future, key technologies will significantly transform demand and provide services at a fraction of today's cost or offer new services not yet imagined. To a large extent, energy paradigm shifts are driven by such evolutions, largely inevitable and often unanticipated, because they provide societies with greater benefits: lower costs, more jobs, and rapid adaptation. This book closes with key novel recommendations for government institutions to accelerate the energy transition, which — instead of replicating an approach from the past — should focus on these demand transformations to both advance civilization and mitigate climate change. With Foreword by Jean-Pascal Tricoire, Schneider Electric Chief Executive Officer.

This book is intended for engineer's in automotive industry and in research community of electrical machines. This book systematically focus on all the major aspects of switched reluctance motor for intelligent electric vehicle applications, including optimization design, drive system control, regenerative braking control, and motor-suspension system control, which is particularly suited for readers who are interested to learn the theory of the motor used for intelligent electric vehicles. The comprehensive and systematic treatment of practical issues around switched reluctance motor considering vehicle requirements is one of the major features of the book. The book can benefit researchers, engineers, and graduate students in fields of switched reluctance motor, electric vehicle drive system, regenerative braking system, motor-suspension system, etc.

This book explores the physics, technology and applications of particle accelerators. It illustrates the interconnections between applications and basic physical principles, enabling readers to better understand current and upcoming technologies and see beyond the paradigmatic borders of the individual fields. The reader will discover why accelerators are no longer just toys for scientists, but have also become modern and efficient nuclear workhorses. The book starts with an introduction to the relevant technologies and radiation safety aspects of accelerating electrons and ions from several keV to roughly 250 MeV. It

subsequently describes the physics behind the interactions of these particle beams with matter. Mathematical descriptions and state-of-the-art computer models of energy-loss and nuclear interactions between the particle beams and targets round out the physics coverage. On this basis, the book then presents the most important accelerator applications in science, medicine, and industry, explaining and comparing more than 20 major application fields, encompassing semiconductors, cancer treatment, and space exploration. Despite the disparate fields involved, this book demonstrates how the same essential technology and physics connects all of these applications.

This is an easily-accessible two-volume encyclopedia summarizing all the articles in the main volumes Kirk-Othmer Encyclopedia of Chemical Technology, Fifth Edition organized alphabetically. Written by prominent scholars from industry, academia, and research institutions, the Encyclopedia presents a wide scope of articles on chemical substances, properties, manufacturing, and uses; on industrial processes, unit operations in chemical engineering; and on fundamentals and scientific subjects related to the field.

The two-volume set IFIP AICT 392 and 393 constitutes the refereed post-conference proceedings of the 6th IFIP TC 5, SIG 5.1 International Conference on Computer and Computing Technologies in Agriculture, CCTA 2012, held in Zhangjiajie, China, in October 2012. The 108 revised papers presented were carefully selected from numerous submissions. They cover a wide range of interesting theories and applications of information technology in agriculture, including Internet of things and cloud computing; simulation models and decision-support systems for agricultural production; smart sensor, monitoring, and control technology; traceability and e-commerce technology; computer vision, computer graphics, and virtual reality; the application of information and communication technology in agriculture; and universal information service technology and service systems development in rural areas. The 55 papers included in the second volume focus on GIS, GPS, RS, and Precision Farming.

This collection of important papers provides a comprehensive overview of low-power system design, from component technologies and circuits to architecture, system design, and CAD techniques. **LOW POWER CMOS DESIGN** summarizes the key low-power contributions through papers written by experts in this evolving field.

Food preservation by irradiation is gaining recognition as a technology that is more environmentally benign than other current processes such as post-harvest chemical fumigation, it has less impact on thermally sensitive compounds than thermal decontamination technologies such as hot water or steam, and the technology is more accessible and cheaper. As the technical and economic feasibility, as well as the level of consumer acceptance, have increased its use has been growing fast. International organizations including the Food and Agriculture Organization of the United Nations (FAO), the International Atomic Energy Agency (IAEA) and the World Health Organization (WHO) have

matrices and microorganisms, legislation and market aspects. It is the first book to cover control and structural analysis in food irradiation and, being written by leading experts in the field, addresses the current global best practices. It contains updated information about the commercial application of food irradiation technology, especially regarding the type of radiation based on food classes and covers dosimetry, radiation chemistry, food decontamination, food quarantine, food processing and food sterilization.

The proceedings of the 20th International Conference on Fluidized Bed Combustion (FBC) collect 9 plenary lectures and 175 peer-reviewed technical papers presented in the conference held in Xi'an China in May 18-21, 2009. The conference was the 20th conference in a series, covering the latest fundamental research results, as well as the application experience from pilot plants, demonstrations and industrial units regarding to the FBC science and technology. It was co-hosted by Tsinghua University, Southeast University, Zhejiang University, China Electricity Council and Chinese Machinery Industry Federation. A particular feature of the proceedings is the balance between the papers submitted by experts from industry and the papers submitted by academic researchers, aiming to bring academic knowledge to application as well as to define new areas for research. The authors of the proceedings are the most active researchers, technology developers, experienced and representative facility operators and manufacturers. They presented the latest research results, state-of-the-art development and projects, and the useful experience. The proceedings are divided into following sections: • CFB Boiler Technology, Operation and Design • Fundamental Research on Fluidization and Fluidized Combustion • CO₂ Capture and Chemical Looping • Gasification • Modeling and Simulation on FBC Technology • Environments and Pollutant Control • Sustainable Fuels The proceedings can be served as idea references for researchers, engineers, academia and graduate students, plant operators, boiler manufacturers, component suppliers, and technical managers who work on FBC fundamental research, technology development and industrial application.

From the discovery of x-rays in 1895 through the emergence of computed tomography (CT) in the 1970s and magnetic resonance imaging (MRI) in the 1980s, non-invasive imaging has revolutionized the practice of medicine. While these technologies have thoroughly penetrated clinical practice, scientists continue to develop novel approaches that promise to push imaging into entirely new clinical realms, while addressing the issues of dose, sensitivity, or specificity that limit existing imaging approaches. *Emerging Imaging Technologies in Medicine* surveys a number of emerging technologies that have the promise to find routine clinical use in the near- (less than five years), mid- (five to ten years) and long-term (more than ten years) time frames. Each chapter provides a detailed discussion of the associated physics and technology, and addresses improvements in terms of dose, sensitivity, and specificity, which are limitations of current imaging approaches. In particular, the book focuses on modalities with

clinical potential rather than those likely to have an impact mainly in preclinical animal imaging. The last ten years have been a period of fervent creativity and progress in imaging technology, with improvements in computational power, nanofabrication, and laser and detector technology leading to major new developments in phase-contrast imaging, photoacoustic imaging, and optical imaging.

This book presents the principles, methods and techniques to characterize materials and technical systems. The book is organized with concise text-graphics compilations in three parts: The first part describes the fundamentals of measurement, testing and sensor technology, including a survey of sensor types for dimensional metrology, kinematics, dynamics, and temperature. It describes also microsensors and embedded sensors. The second part gives an overview of materials and explains the application of measurement, testing and sensor technology to characterize composition, microstructure, properties and performance of materials as well as deterioration mechanisms and reliability. The third part introduces the general systems theory for the characterization of technical systems, exemplified by mechatronic and tribological systems. It describes technical diagnostics for structural health monitoring and performance control.

This volume comprises the select proceedings of FiMPART 2015. The volume covers advances in major areas of materials research under one umbrella. This volume covers all aspects of materials research, processing, fabrication, structure/property evaluation, applications of ferrous, non-ferrous, ceramic, polymeric materials and composites including biomaterials, materials for energy, fuel cells/hydrogen storage technologies, batteries, super-capacitors, nano-materials for energy and structural applications, aerospace structural metallic materials, bulk metallic glasses and other advanced materials. The book will be useful to researchers, students, and professional working in areas related to materials innovation and applications.

Coal Production and Processing Technology provides uniquely comprehensive coverage of the latest coal technologies used in everything from mining to greenhouse gas mitigation. Featuring contributions from experts in industry and academia, this book: Discusses coal geology, characterization, beneficiation, combustion, coking, gasification, and liquef

Materials for Additive Manufacturing covers the materials utilized in the additive manufacturing field, including polymers, metals, alloys and ceramic materials. A conceptual overview of the preparation and characterization of the materials and their processing is given, beginning with theoretical aspects that help readers better understand fundamental concepts. Emerging applications in medicine, aerospace, automotive, artwork and rapid manufacturing are also discussed. This book provides a comprehensive overview of materials, along with rapid prototyping technologies. Discusses the preparation and characterization of materials used for additive manufacturing Provides descriptions of microstructures and properties of the parts produced by additive manufacturing Includes recent industrial applications of materials

processed in additive manufacturing

This guide was prepared in 1965 as a working tool for SCS conservationists in the Midwest to use in identifying native perennial grasses found in their particular work area.

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