Advanced Lithium Ion Batteries For Automotive Applications

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Graphene and Carbon Nanotubes for Advanced Lithium Ion Batteries - Stelbin Peter Figerez 2018-12-07
This title covers the fundamentals of carbon nanomaterials in a logical and clear manner to make concepts accessible to researchers from different disciplines. It summarizes in a comprehensive manner recent technological and scientific accomplishments in the area of carbon nanomaterials and their application in lithium ion batteries The book also addresses all the components anodes, cathodes and electrolytes of lithium ion battery and discusses the technology of lithium ion batteries that can safely operate at high temperature.
Lithium-Ion Batteries: Basics and Applications - Reiner Korthauer 2018-08-07
The handbook focuses on a complete outline of lithium-ion batteries. Just before starting with an exposition of the fundamentals of this system, the book gives a short explanation of the newest cell generation. The most important elements are described as negative / positive electrode materials, electrolytes, seals and separators. The battery disconnect unit and the battery management system are important parts of modern lithium-ion batteries. An economical, faultless and efficient battery production is a must today and is represented with one chapter in the handbook. Cross-cutting issues like electrical, chemical, functional safety are further topics. Last but not least standards and transportation themes are the final chapters of the handbook. The different topics of the handbook provide a good knowledge base not only for those working daily on electrochemical energy storage, but also to scientists, engineers and students concerned in modern battery systems.
Rechargeable Lithium-Ion Batteries - M. Winter 2010-04
The papers included in this issue of ECS Transactions were originally presented in the symposium ¿Rechargeable Lithium and Lithium-Ion Batteries¿, held during the 216th meeting of The Electrochemical Society, in Vienna, Austria from October 4 to 9, 2009.
Nanotechnology-Based Additive Manufacturing - Kalim Deshmukh 2022-12-20
Nanotechnology-Based Additive Manufacturing State-of-the-art overview of additive manufacturing techniques with an emphasis on processes, product designs and applications This book offers a thorough overview of additive manufacturing technologies, including manufacturing requirements, product design, optimization of processes and product parameters to reduce manufacturing costs. It provides a comprehensive and state-of-the-art review on various additive manufacturing technologies, their advantages, shortcomings, potential applications and future directions.

Sample topics discussed by the three well-qualified editors on the topic of additive manufacturing include: Areas of application in the fields of electronics, aerospace, construction, automobile, sports and biomedicine Material considerations, the requirement of specific design, fabrication and processing methods Advantages and disadvantages of various 3D printing techniques for the respectively intended applications This book is an immensely valuable resource for researchers working in the field of additive manufacturing or 3D printing, or for developers dealing with the processing and manufacturing of materials and products for advanced technologies.

Advanced Battery Development - 1989

Proceedings - 2005

Lithium-Ion Batteries - Yoshiaki Kato 2019-04-05

High-performance secondary batteries, also called rechargeable or storage batteries, are a key component of electric automobiles, power storage for renewable energies, load levellers of electric power lines, base stations for mobile phones, and emergency power supply in hospitals, in addition to having application in energy security and realization of a low-carbon and resilient society. A detailed understanding of the physics and chemistry that occur in secondary batteries is required for developing next-generation secondary batteries with improved performance. Among various types of secondary batteries, lithium-ion batteries are most widely used because of their high energy density, small memory effect, and low self-discharge rate. This book introduces lithium-ion batteries, with an emphasis on their overview, roadmaps, and simulations. It also provides extensive descriptions of ion beam analysis and prospects for in situ diagnostics of lithium-ion batteries. The chapters are written by specialists in cutting-edge research on lithium-ion batteries and related subjects. The book will be a great reference for advanced undergraduate- and graduate-level students, researchers, and engineers in electrochemistry, nanotechnology, and diagnostic methods and instruments.

Advanced Battery Management Technologies for Electric Vehicles - Rui Xiong 2019-02-26

A comprehensive examination of advanced battery management technologies and practices in modern electric vehicles Policies surrounding energy sustainability and environmental impact have become of increasing interest to governments, industries, and the general public worldwide. Policies embracing strategies that reduce fossil fuel dependency and greenhouse gas emissions have driven the widespread adoption of electric vehicles (EVs), including hybrid electric vehicles (HEVs), pure electric vehicles (PEVs) and plug-in electric vehicles (PHEVs). Battery management systems (BMSs) are crucial components of such vehicles, protecting a battery system from operating outside its Safe Operating Area (SOA), monitoring its working conditions, calculating and reporting its states, and charging and balancing the battery system. Advanced Battery Management Technologies for Electric Vehicles is a compilation of contemporary model-based state estimation methods and battery charging and balancing techniques, providing readers with practical knowledge of both fundamental concepts and practical applications. This timely and highly-relevant text covers essential areas such as battery modeling and battery state of charge, energy, health and power estimation methods. Clear and accurate background information, relevant case studies, chapter summaries, and reference citations help readers to fully comprehend each topic in a practical context. Offers up-to-date coverage of modern battery management technology and practice Provides case studies of real-world engineering applications Guides readers from electric vehicle fundamentals to advanced battery management topics Includes chapter introductions and summaries, case studies, and color charts, graphs, and illustrations Suitable for advanced undergraduate and graduate coursework, Advanced Battery Management Technologies for Electric Vehicles is equally valuable as a reference for professional researchers and engineers.

Lithium-Ion Batteries - Gianfranco Pistoia 2013-12-16

Lithium-Ion Batteries features an in-depth description of different lithium-ion applications, including important features such as safety and

reliability. This title acquaints readers with the numerous and often consumer-oriented applications of this widespread battery type. Lithium-Ion Batteries also explores the concepts of nanostructured materials, as well as the importance of battery management systems. This handbook is an invaluable resource for electrochemical engineers and battery and fuel cell experts everywhere, from research institutions and universities to a worldwide array of professional industries. Contains all applications of consumer and industrial lithium-ion batteries, including reviews, in a single volume Features contributions from the world's leading industry and research experts Presents executive summaries of specific case studies Covers information on basic research and application approaches

Department of the Interior and Related Agencies Appropriations for 1998: Justification of the budget estimates, United States Forest Service, Department of Energy - United States. Congress. House. Committee on Appropriations. Subcommittee on Department of the Interior and Related Agencies 1997

Electrochemical Power Sources: Fundamentals, Systems, and Applications - Jürgen Garche 2018-09-28

Safety of Lithium Batteries describes how best to assure safety during all phases of the life of Lithium ion batteries (production, transport, use, and disposal). About 5 billion Li-ion cells are produced each year, predominantly for use in consumer electronics. This book describes how the high-energy density and outstanding performance of Li-ion batteries will result in a large increase in the production of Li-ion cells for electric drive train vehicle (xEV) and battery energy storage (BES or EES) purposes. The high-energy density of Li battery systems comes with special hazards related to the materials employed in these systems. The manufacturers of cells and batteries have strongly reduced the hazard probability by a number of measures. However, absolute safety of the Li system is not given as multiple incidents in consumer electronics have shown. Presents the relationship between chemical and structure material properties and cell safety Relates cell and battery design to safety as well as system operation parameters to safety Outlines the influences of abuses on safety and the relationship to battery testing Explores the limitations for transport and storage of cells and batteries Includes recycling, disposal and second use of lithium ion batteries

Modern Automotive Electrical Systems - Pedram Asef 2022-12-28

MODERN AUTOMOTIVE ELECTRICAL SYSTEMS Presenting the concepts and advances of modern automotive electrical systems, this volume, written and edited by a global team of experts, also goes into the practical applications for the engineer, student, and other industry professionals. In recent decades, the rapid and mature development of electronics and electrical components and systems have inevitably been recognized in the automotive industry. This book serves engineers, scientists, students, and other industry professionals as a guide to learn fundamental and advanced concepts and technologies with modelling simulations and case studies. After reading this book, users will have understood the main electrical and electronic components used in electric vehicles (EVs). In this new volume are many fundamentals and advances of modern automotive electrical systems, such as advanced technologies in modern automotive electrical systems, electrical machines characterization and their drives technology for EVs, modeling and analysis of energy storage systems, applied artificial intelligence techniques for energy management systems, fault detection and isolation in electric powertrains, and thermal management for automotive electrical systems. Also covered are new innovations, such as the use of power electronics in low and high voltage circuits, electrified propulsion systems, energy storage systems, and intelligent energy management methods in EVs. Valuable as a learning tool for beginners in this area as well as a daily reference for engineers and scientists working in these areas, this is a must-have for any library.

Advanced Nanomaterials for Pollutant Sensing and Environmental Catalysis - Qidong Zhao 2019-09-13

Advanced Nanomaterials for Pollutant Sensing and Environmental Catalysis presents the most recent advances and scientific discoveries in the

fields of environmental protection and sensing with nanotechnology. The book's authors highlight recent advancements in how nanotechnology is being used to create more efficient pollution controls, with particular attention given to noble metal nanosensors, novel hollow micro-/nanostructures with innovative functions, and advanced nanocatalysts based on carbon materials for water splitting. Each chapter demonstrates the fundamentals of the technology, illustrating key concepts and highlighting the latest developments and challenges in these multi-disciplinary fields. This book is a valuable resource for academic researchers, graduate students and R&D professionals in the fields of material science, chemistry, environmental science and nanotechnology. Presents the current state-of-the-art and covers the fundamentals and related technologies from a strong chemical, material and environmental engineering background Covers current trends and issues, including nontoxicity, efficiency of decomposition, and the sensitivity of nanomaterials used for sensing and environmental remediation Highlights the benefits and challenges of using nanomaterials to control pollution

Proceedings of the International Conference on Information Engineering and Applications (IEA) 2012 - Zhicai Zhong 2013-03-12

Information engineering and applications is the field of study concerned with constructing information computing, intelligent systems, mathematical models, numerical solution techniques, and using computers and other electronic devices to analyze and solve natural scientific, social scientific and engineering problems. Information engineering is an important underpinning for techniques used in information and computational science and there are many unresolved problems worth studying. The Proceedings of the 2nd International Conference on Information Engineering and Applications (IEA 2012), which was held in Chongqing, China, from October 26-28, 2012, discusses the most innovative research and developments including technical challenges and social, legal, political, and economic issues. A forum for engineers and scientists in academia, industry, and government, the Proceedings of the 2nd International Conference on Information Engineering and Applications presents ideas, results, works in progress, and experience in all aspects of information engineering and applications.

Batteries - Ronald K Jurgen 2010-11-29

With production and planning for new electric vehicles gaining momentum worldwide, this book – the second in a series of five volumes on this subject – provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid-electric vehicle technology, design considerations, and components. This book features 15 SAE technical papers, published from 2008 through 2010, that provide an overview of research on electric vehicle batteries. Topics include: Charging strategy studies for PHEV batteries Electric vehicle and hybrid-electric vehicle rechargeable energy storage systems Strategies for reducing plug-in battery costs Cold temperature performance Lithium-ion battery power capability testing, crash safety, and modeling

Modeling and Control of Hybrid Propulsion System for Ground Vehicles - Yuan Zou 2018-07-02

This book focuses on the systematic design of architectures, parameters and control of typical hybrid propulsion systems for wheeled and tracked vehicles based on a combination of theoretical research and engineering practice. Adopting a mechatronic system dynamics perspective, principles and methods from the fields of optimal control and system optimization are applied in order to analyze the hybrid propulsion configuration and controller design. Case investigations for typical hybrid propulsion systems of wheeled and tracked ground vehicles are also provided.

The Hydrogen Economy - Michael Ball 2009-09-24

Responding to the sustained interest in and controversial discussion of the prospects of hydrogen, this book strives to reflect on the perspectives of a hydrogen economy in light of the global energy challenge, in particular the question of how to meet the growing demand for transport energy in the long term and how to secure sustainable energy for transportation.

This book stands out from other publications by its emphasis on setting the scene for hydrogen, and the comprehensive coverage of all aspects related to the hydrogen subject. It aims to provide a reference and compendium about hydrogen that should be of interest to anyone who wants to catch up on the status of the hydrogen discussion, look up a specific aspect related to hydrogen, or understand how hydrogen comes off compared to other mobility solutions. The book should appeal to a fairly broad readership: academia, policy makers and industry.

Smart Technologies for Energy, Environment and Sustainable Development, Vol 1 - Mohan Lal Kolhe 2022

This book contains select proceedings of the International Conference on Smart Technologies for Energy, Environment, and Sustainable Development (ICSTEESD 2020). The book is broadly divided into the themes of energy, environment, and sustainable development; and discusses the significance and solicitations of intelligent technologies in the domain of energy and environmental systems engineering. Topics covered in this book include sustainable energy systems including renewable technologies, energy efficiency, techno-economics of energy system and policies, integrated energy system planning, environmental management, energy efficient buildings and communities, sustainable transportation, smart manufacturing processes, etc. The book will be a valuable reference for young researchers, professionals, and policy makers working in the areas of energy, environment and sustainable development.

Department of the Interior and Related Agencies Appropriations for 1998 - United States. Congress. House. Committee on Appropriations. Subcommittee on Department of the Interior and Related Agencies 1997

Batteries - Ronald K Jurgen 2010-11-29

With production and planning for new electric vehicles gaining momentum worldwide, this book – the second in a series of five volumes on this subject – provides engineers and researchers with perspectives on the most current and innovative developments regarding electric and hybrid-electric vehicle technology, design considerations, and components. This book features 15 SAE technical papers, published from 2008 through 2010, that provide an overview of research on electric vehicle batteries. Topics include: Charging strategy studies for PHEV batteries Electric vehicle and hybrid-electric vehicle rechargeable energy storage systems Strategies for reducing plug-in battery costs Cold temperature performance Lithium-ion battery power capability testing, crash safety, and modeling

Advanced Microsystems for Automotive Applications 2014 - Jan Fischer-Wolfarth 2014-06-17

The automobile is going through the biggest transformation in its history. Automation and electrification of vehicles are expected to enable safer and cleaner mobility. The prospects and requirements of the future automobile affect innovations in major technology fields like driver assistance systems, vehicle networking and drivetrain development. Smart systems such as adaptive ICT components and MEMS devices, novel network architectures, integrated sensor systems, intelligent interfaces and functional materials form the basis of these features and permit their successful and synergetic integration. It has been the mission of the International Forum on Advanced Microsystems for Automotive Applications (AMAA) for more than fifteen years to detect novel trends and to discuss the technological implications from early on. Therefore, the topic of the AMAA 2014 will be “Smart Systems for Safe, Clean and Automated Vehicles”. This book contains peer-reviewed papers written by leading engineers and researchers which all address the ongoing research and novel developments in the field.

Electrospinning for Advanced Energy Storage Applications - Neethu T. M. Balakrishnan 2021

This book provides a consolidated description of the process of electro-spinning and detailed properties and applications of electro-spun electrodes and electrolytes in energy storage devices. It discusses the preparation, structure and electrochemical properties of nanofiber electrode and electrolyte materials. It focuses exclusively on Lithium Ion batteries, with the contents discussing different aspects of electrospinning in storage systems. This book aims to provide a comprehensive resource to

help researchers choose the best electrodes and electrolyte materials based on the properties required for their desired commercial applications. It will be a useful guide to graduate students and researchers working in solid-state chemistry, physics, materials chemistry, and chemical engineering on aspects of energy storage.

Building the U.S. Battery Industry for Electric Drive Vehicles - National Research Council 2013-01-03

Since 1991, the National Research Council, under the auspices of the Board on Science, Technology, and Economic Policy, has undertaken a program of activities to improve policymakers' understandings of the interconnections of science, technology, and economic policy and their importance for the American economy and its international competitive position. The Board's activities have corresponded with increased policy recognition of the importance of knowledge and technology to economic growth. The goal of the this symposium was to conduct two public symposia to review and analyze the potential contributions of public-private partnerships and identify other relevant issues for the Department of Energy, Office of Vehicle Technologies, Energy Storage Team's activities in the energy storage research and development area. The symposia will also identify lessons from these and other domestic and international experiences to help inform DoE as to whether its activities are complete and appropriately focused. Additional topics that emerge in the course of the planning may also be addressed. Building the U.S. Battery Industry for Electric Drive Vehicles: Summary of a Symposium gathers representatives from leading battery manufacturers, automotive firms, university researchers, academic and industry analysts, congressional staff, and federal agency representatives. An individually-authored summary of each symposium will be issued. The symposium was held in Michigan in order to provide direct access to the policymakers and industrial participants drawn from the concentration of battery manufacturers and automotive firms in the region. The symposium reviewed the current state, needs, and challenges of the U.S. advanced battery manufacturing industry; challenges and opportunities in battery R&D, commercialization, and deployment; collaborations between the automotive industry and battery industry; workforce issues, and supply chain development. It also focused on the impact of DoE's investments and the role of state and federal programs in support of this growing industry. This task of this report is to summarize the presentations and discussions that took place at this symposium. Needless to say, the battery industry has evolved very substantially since the conference was held, and indeed some of the caveats raised by the speakers with regard to overall demand for batteries and the prospects of multiple producers now seem prescient. At the same time, it is important to understand that it is unrealistic to expect that all recipients of local, state, or federal support in a complex and rapidly evolving industry will necessarily succeed. A number of the firms discussed here have been absorbed by competitors, others have gone out of business, and others continue to progress.

Reducing Fuel Consumption and Greenhouse Gas Emissions of Medium- and Heavy-Duty Vehicles, Phase Two - National Academies of Sciences, Engineering, and Medicine 2020-05-15

Medium- and heavy-duty trucks, motor coaches, and transit buses - collectively, "medium- and heavy-duty vehicles", or MHDVs - are used in every sector of the economy. The fuel consumption and greenhouse gas emissions of MHDVs have become a focus of legislative and regulatory action in the past few years. This study is a follow-on to the National Research Council's 2010 report, Technologies and Approaches to Reducing the Fuel Consumption of Medium-and Heavy-Duty Vehicles. That report provided a series of findings and recommendations on the development of regulations for reducing fuel consumption of MHDVs. On September 15, 2011, NHTSA and EPA finalized joint Phase I rules to establish a comprehensive Heavy-Duty National Program to reduce greenhouse gas emissions and fuel consumption for on-road medium- and heavy-duty vehicles. As NHTSA and EPA began working on a second round of standards, the National Academies issued another report, Reducing the Fuel Consumption and Greenhouse

Gas Emissions of Medium- and Heavy-Duty Vehicles, Phase Two: First Report, providing recommendations for the Phase II standards. This third and final report focuses on a possible third phase of regulations to be promulgated by these agencies in the next decade.

Encyclopedia of Automotive Engineering - David Crolla 2015-03-23

A Choice Oustanding Academic Title The Encyclopedia of Automotive Engineering provides for the first time a large, unified knowledge base laying the foundation for advanced study and in-depth research. Through extensive cross-referencing and search functionality it provides a gateway to detailed but scattered information on best industry practice, engendering a better understanding of interrelated concepts and techniques that cut across specialized areas of engineering. Beyond traditional automotive subjects the Encyclopedia addresses green technologies, the shift from mechanics to electronics, and the means to produce safer, more efficient vehicles within varying economic restraints worldwide. The work comprises nine main parts: (1) Engines: Fundamentals (2) Engines: Design (3) Hybrid and Electric Powertrains (4) Transmission and Driveline (5) Chassis Systems (6) Electrical and Electronic Systems (7) Body Design (8) Materials and Manufacturing (9) Telematics. Offers authoritative coverage of the wide-ranging specialist topics encompassed by automotive engineering An accessible point of reference for entry level engineers and students who require an understanding of the fundamentals of technologies outside of their own expertise or training Provides invaluable guidance to more detailed texts and research findings in the technical literature Developed in conjunction with FISITA, the umbrella organisation for the national automotive societies in 37 countries around the world and representing more than 185,000 automotive engineers 6 Volumes www.automotive-reference.com An essential resource for libraries and information centres in industry, research and training organizations, professional societies, government departments, and all relevant engineering departments in the academic sector.

Energy Materials Coordinating Committe (EMaCC): Fiscal Year 1999 Annual Technical Report -

Encyclopedia of Electrochemical Power Sources - Jurgen Garche 2013-05-20

The Encyclopedia of Electrochemical Power Sources is a truly interdisciplinary reference for those working with batteries, fuel cells, electrolyzers, supercapacitors, and photo-electrochemical cells. With a focus on the environmental and economic impact of electrochemical power sources, this five-volume work consolidates coverage of the field and serves as an entry point to the literature for professionals and students alike. Covers the main types of power sources, including their operating principles, systems, materials, and applications Serves as a primary source of information for electrochemists, materials scientists, energy technologists, and engineers Incorporates nearly 350 articles, with timely coverage of such topics as environmental and sustainability considerations

Options and Opportunities for Onsite Renewable Energy Integration - United States. Congress. House. Committee on Science and Technology (2007) 2010

Advances in Battery Technologies for Electric Vehicles - Bruno Scrosati 2015-05-25

Advances in Battery Technologies for Electric Vehicles provides an in-depth look into the research being conducted on the development of more efficient batteries capable of long distance travel. The text contains an introductory section on the market for battery and hybrid electric vehicles, then thoroughly presents the latest on lithium-ion battery technology. Readers will find sections on battery pack design and management, a discussion of the infrastructure required for the creation of a battery powered transport network, and coverage of the issues involved with end-of-life management for these types of batteries. Provides an in-depth look into new research on the development of more efficient, long distance travel batteries Contains an introductory section on the market for battery and hybrid electric vehicles Discusses battery pack design and management and the issues involved with end-of-life management for these types of batteries

Electric Vehicle Batteries: Moving from

Research towards Innovation - Emma Briec 2014-12-26

This edited volume presents research results of the PPP European Green Vehicle Initiative (EGVI), focusing on electric vehicle batteries. Electrification is one road towards sustainable road transportation, and battery technology is one of the key enabling technologies. However, at the same time, battery technology is one of the main obstacles for a broad commercial launch of electric vehicles. This book includes research contributions which try to bridge the gap between research and innovation in the field of battery technology for electric vehicles. The target audience primarily comprises researchers and experts in the field.

Lead-Acid Batteries for Future Automobiles - Jürgen Garche 2017-02-21

Lead-Acid Batteries for Future Automobiles provides an overview on the innovations that were recently introduced in automotive lead-acid batteries and other aspects of current research. Innovative concepts are presented, some of which aim to make lead-acid technology a candidate for higher levels of powertrain hybridization, namely 48-volt mild or high-volt full hybrids. Lead-acid batteries continue to dominate the market as storage devices for automotive starting and power supply systems, but are facing competition from alternative storage technologies and being challenged by new application requirements, particularly related to new electric vehicle functions and powertrain electrification. Presents an overview of development trends for future automobiles and the demands that they place on the battery Describes how to adapt LABs for use in micro and mild hybrid EVs via collector construction and materials, via carbon additives, via new cell construction (bipolar), and via LAB hybrids with Li-ion and supercap systems System integration of LABs into vehicle power-supply and hybridization concepts Short description of competitive battery technologies

Advanced Fluoride-Based Materials for Energy Conversion - Tsuyoshi Nakajima 2015-04-30

Advanced Fluoride-Based Materials for Energy Conversion provides thorough and applied information on new fluorinated materials for chemical energy devices, exploring the electrochemical properties and behavior of fluorinated materials in lithium ion and sodium ion batteries, fluoropolymers in fuel cells, and fluorinated carbon in capacitors, while also exploring synthesis applications, and both safety and stability issues. As electronic devices, from cell phones to hybrid and electric vehicles, are increasingly common and prevalent in modern lives and require dependable, stable chemical energy devices with high-level functions are becoming increasingly important. As research and development in this area progresses rapidly, fluorine compounds play a critical role in this rapid progression. Fluorine, with its small size and the highest electronegativity, yields stable compounds under various conditions for utilization as electrodes, electrolytes, and membranes in energy devices. The book is an ideal reference for the chemist, researcher, technician, or academic, presenting valuable, current insights into the synthesis of fluorine compounds and fluorination reactions using fluorinating agents. Provides thorough and applied information on new fluorinated materials for chemical energy devices Describes the emerging role of stable energy devices with high-level functions and the research surrounding the technology Ideal for the chemist, research, technician, or academic seeking current insights into the synthesis of fluorine compounds and fluorination reactions using fluorinating agents

Battery Management System and its Applications - Xiaojun Tan 2023-02-21

BATTERY MANAGEMENT SYSTEM AND ITS APPLICATIONS Enables readers to understand basic concepts, design, and implementation of battery management systems Battery Management System and its Applications is an all-in-one guide to basic concepts, design, and applications of battery management systems (BMS), featuring industrially relevant case studies with detailed analysis, and providing clear, concise descriptions of performance testing, battery modeling, functions, and topologies of BMS. In Battery Management System and its Applications, readers can expect to find information on: Core and basic concepts of BMS, to help readers establish a foundation of relevant knowledge before more advanced concepts are introduced Performance testing

and battery modeling, to help readers fully understand Lithium-ion batteries Basic functions and topologies of BMS, with the aim of guiding readers to design simple BMS themselves Some advanced functions of BMS, drawing from the research achievements of the authors, who have significant experience in cross-industry research Featuring detailed case studies and industrial applications, Battery Management System and its Applications is a must-have resource for researchers and professionals working in energy technologies and power electronics, along with advanced undergraduate/postgraduate students majoring in vehicle engineering, power electronics, and automatic control.

Nickel - Nnamdi Anyadike 2002-03-15

This far-reaching report addresses nickel industry's key issues as it emerges from the roller-coaster ride of price volatility which has characterised it in recent years. In 2002 the indications are for an upswing in demand as industrial activity starts to pick up again: however, on the supply side it is unclear how much output will be realised from the "mega" projects that were announced that the end of the 1990s. Both nickel consumption and prices could be adversely affected in the future by environmental restrictions, increasing substitution of nickel-containing materials and the development of relatively low-grade lateritic nickel deposits. Up-to-date, in-depth research and analysis to make you an authority on the world's major nickel markets Presenting a truly global picture, this report examines the current state of the nickel industry and the prospects for the future. Some key findings of this report Some analysts predict that PAL technology could increase world nickel supply by 0.8 million tonnes per year within the next 10 years. Murrin Murrin, the largest of the three Australian "mega" projects, will be a major addition to Australia's nickel-producing capacity. Anaconda and Glencore have committed to expanding its total nickel production capacity to 115,000 tonnes per annum. Total world demand for primary nickel grew by 6.3% in 2000 to reach a record level of 1,115,000 tonnes. Demand for nickel in batteries is expected to soar, fuelled by increased consumption of both rechargeable batteries and new forms of automotive batteries. The future levels of production and consumption in Russia are expected to continue to have significant, but unpredictable, effects on world nickel prices. A clear and detailed analysis of the industry and its major markets A survey of trends in mining, refining, processing, end-use and consumption Unique industry and market forecasts

The Handbook of Lithium-Ion Battery Pack Design - John T Warner 2015-05-23

The Handbook of Lithium-Ion Battery Pack Design: Chemistry, Components, Types and Terminology offers to the reader a clear and concise explanation of how Li-ion batteries are designed from the perspective of a manager, sales person, product manager or entry level engineer who is not already an expert in Li-ion battery design. It will offer a layman’s explanation of the history of vehicle electrification, what the various terminology means, and how to do some simple calculations that can be used in determining basic battery sizing, capacity, voltage and energy. By the end of this book the reader has a solid understanding of all of the terminology around Li-ion batteries and is able to do some simple battery calculations. The book is immensely useful to beginning and experienced engineer alike who are moving into the battery field. Li-ion batteries are one of the most unique systems in automobiles today in that they combine multiple engineering disciplines, yet most engineering programs focus on only a single engineering field. This book provides you with a reference to the history, terminology and design criteria needed to understand the Li-ion battery and to successfully lay out a new battery concept. Whether you are an electrical engineer, a mechanical engineer or a chemist this book helps you better appreciate the inter-relationships between the various battery engineering fields that are required to understand the battery as an Energy Storage System. Offers an easy explanation of battery terminology and enables better understanding of batteries, their components and the market place. Demonstrates simple battery scaling calculations in an easy to understand description of the formulas Describes clearly the various components of a Li-ion battery and their importance Explains the differences between various Li-ion cell types and chemistries and

enables the determination which chemistry and cell type is appropriate for which application Outlines the differences between battery types, e.g., power vs energy battery Presents graphically different vehicle configurations: BEV, PHEV, HEV Includes brief history of vehicle electrification and its future

Behaviour of Lithium-Ion Batteries in Electric Vehicles - Gianfranco Pistoia 2018-02-10

This book surveys state-of-the-art research on and developments in lithium-ion batteries for hybrid and electric vehicles. It summarizes their features in terms of performance, cost, service life, management, charging facilities, and safety. Vehicle electrification is now commonly accepted as a means of reducing fossil-fuels consumption and air pollution. At present, every electric vehicle on the road is powered by a lithium-ion battery. Currently, batteries based on lithium-ion technology are ranked first in terms of performance, reliability and safety. Though other systems, e.g., metal-air, lithium-sulphur, solid state, and aluminium-ion, are now being investigated, the lithium-ion system is likely to dominate for at least the next decade – which is why several manufacturers, e.g., Toyota, Nissan and Tesla, are chiefly focusing on this technology. Providing comprehensive information on lithium-ion batteries, the book includes contributions by the world's leading experts on Li-ion batteries and vehicles.

Zukunft durch Informationstechnik - Informationstechnische Gesellschaft 2004

Sustainable Business: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2019-08-02

In the increasingly competitive corporate sector, businesses must examine their current practices to ensure business success. By examining their social, financial, and environmental risks, obligations, and opportunities, businesses can re-design their operations more effectively to ensure prosperity. Sustainable Business: Concepts, Methodologies, Tools, and Applications is a vital reference source that explores the best practices that promote business sustainability, including examining how economic, social, and environmental aspects are related to each other in the company's management and performance. Highlighting a range of topics such as lean manufacturing, sustainable business model innovation, and ethical consumerism, this multi-volume book is ideally designed for entrepreneurs, business executives, business professionals, managers, and academics seeking current research on sustainable business practices.

Electric Vehicle Integration in a Smart Microgrid Environment - Mohammad Saad Alam 2021-08-19

Electric Vehicle Integration in a Smart Microgrid Environment The growing demand for energy in today's world, especially in the Middle East and Southeast Asia, has been met with massive exploitation of fossil fuels, resulting in an increase in environmental pollutants. In order to mitigate the issues arising from conventional internal combustion engine-powered vehicles, there has been a considerable acceleration in the adoption of electric vehicles (EVs). Research has shown that the impact of fossil fuel use in transportation and surging demand in power owing to the growing EV charging infrastructure can potentially be minimalized by smart microgrids. As EVs find wider acceptance with major advancements in high efficiency drivetrain and vehicle design, it has become clear that there is a need for a system-level understanding of energy storage and management in a microgrid environment. Practical issues, such as fleet management, coordinated operation, repurposing of batteries, and environmental impact of recycling and disposal, need to be carefully studied in the context of an ageing grid infrastructure. This book explores such a perspective with contributions from leading experts on planning, analysis, optimization, and management of electrified transportation and the transportation infrastructure. The primary purpose of this book is to capture state-of-the-art development in smart microgrid management with EV integration and their applications. It also aims to identify potential research directions and technologies that will facilitate insight generation in various domains, from smart homes to smart cities, and within industry, business, and consumer applications. We expect the book to serve as a reference for a larger audience, including power system architects,

practitioners, developers, new researchers, and graduate-level students, especially for emerging clean energy and transportation electrification sectors in the Middle East and Southeast Asia.

Future Lithium-ion Batteries - Ali Eftekhari 2019-03-14

Lithium-ion batteries are an established technology with recent large-scale batteries finding emerging markets for electric vehicles and household energy storage. Battery research during the past two decades has focussed on practical improvements to available batteries, such as cell design to enhance energy density, which are currently nearing their maximum potential. We must now consider alternative avenues of research in pursuit of a new breakthrough in this technology. This book collects authoritative perspectives from leading researchers to project the emerging opportunities in the field of lithium-ion batteries. Covering topics including anode and cathode materials, electrolytes, emerging markets and the challenges and opportunities of lithium-ion battery supply, it will provide researchers with cutting-edge leads to advance the next generation of materials. Edited by a pioneer in the field, and with contributions from experts from across the globe, this book will be of use to graduate students and researchers in academia and industry interested in lithium-ion batteries and energy storage.