

The Worldwide Battery Market 2012 2025 Avicenne

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Climate Change and Energy Dynamics in the Middle East - Hassan Qudrat-Ullah 2019-03-28

This edited volume presents chapters on the dynamics of global climate change and global warming in the Middle East. In this region, it should be noted that even slightly warmer weather can result in an increased demand of energy along with its lower supply, as well as lower labor productivity. This text focuses on modeling, simulation, system dynamics, and agent-based modeling in dealing with these issues. The latest decision making tools, techniques, and innovative solutions used to overcome these challenges are presented. Many distinguished researchers contribute their work herein. The audience for this volume includes policy makers, researchers, and students unified by the common goal of making better decisions in the sustainable production and consumption of energy. The practical orientation of the chapters within each part is intended to suit the practitioners: managers and decision makers in the energy sector of the Middle East region.

Technological Learning in the Transition to a Low-Carbon Energy System - Martin Junginger 2019-11-25

Technological Learning in the Transition to a Low-Carbon Energy System: Conceptual Issues, Empirical Findings, and Use in Energy Modeling quantifies key trends and drivers of energy technologies deployed in the energy transition. It uses the experience curve tool to show how future cost reductions and cumulative deployment of these technologies may shape the future mix of the electricity, heat and transport sectors. The book explores experience curves in detail, including possible pitfalls, and demonstrates how to quantify the 'quality' of experience curves. It discusses how this tool is implemented in models and addresses methodological challenges and solutions. For each technology, current market trends, past cost reductions and underlying drivers, available experience curves, and future prospects are considered. Electricity, heat and transport sector models are explored in-depth to show how the future deployment of these technologies—and their associated costs—determine whether ambitious decarbonization climate targets can be reached - and at what costs. The book also addresses lessons and recommendations for policymakers, industry and academics, including key technologies requiring further policy support, and what scientific knowledge gaps remain for future research. Provides a comprehensive overview of trends and drivers for major energy technologies expected to play a role in the energy transition Delivers data on cost trends, helping readers gain insights on how competitive energy technologies may become, and why Reviews the use of learning curves in environmental impacts for lifecycle assessments and energy modeling Features social learning for cost modeling and technology diffusion, including where consumer preferences play a major role

Ionic Liquids II - Barbara Kirchner 2018-09-03

The series Topics in Current Chemistry Collections presents critical reviews from the journal Topics in Current Chemistry organized in topical volumes. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to give the non-specialist reader, whether in academia or industry, a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented using selected examples to illustrate the principles discussed. The coverage is not intended to be

an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field. The chapters "Ionic Liquid-Liquid Chromatography: A New General Purpose Separation Methodology", "Proteins in Ionic Liquids: Current Status of Experiments and Simulations", "Lewis Acidic Ionic Liquids" and "Quantum Chemical Modeling of Hydrogen Bonding in Ionic Liquids" are available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

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

Lithium Process Chemistry - Alexandre Chagnes 2015-06-14

Lithium Process Chemistry: Resources, Extraction, Batteries and Recycling presents, for the first time, the most recent developments and state-of-the-art of lithium production, lithium-ion batteries, and their recycling. The book provides fundamental and theoretical knowledge on hydrometallurgy and electrochemistry in lithium-ion batteries, including terminology related to these two fields. It is of particular interest to electrochemists who usually have no knowledge in hydrometallurgy and hydrometallurgists not familiar with electrochemistry applied to Li-ion batteries. It is also useful for both teachers and students, presenting an overview on Li production, Li-ion battery technologies, and lithium battery recycling processes that is accompanied by numerous graphical presentations of different battery systems and their electrochemical performances. The book represents the first time that hydrometallurgy and electrochemistry on lithium-ion batteries are assembled in one unique source. Provides fundamental and theoretical knowledge on hydrometallurgy and electrochemistry in lithium-ion batteries Represents the first time that hydrometallurgy and electrochemistry on lithium-ion batteries are assembled in one unique source. Ideal for both electrochemists who usually have no knowledge in hydrometallurgy and hydrometallurgists not familiar with electrochemistry applied to Li-ion batteries Presents recent developments, as well as challenges in lithium production and lithium-ion battery technologies and their recycling Covers examples of Li processes production with schematics, also including numerous graphical presentations of different battery systems and their electrochemical performances

Nachhaltige Dienstleistungsinnovationen in der Logistik - Cornelius Moll 2019-10-03

Die wachsende Bedeutung von Nachhaltigkeit in Verbindung mit der hohen Ressourcenintensität der Logistik machen nachhaltige Dienstleistungsinnovationen in der Logistik erforderlich. Cornelius Moll präsentiert eine Methodik zur Entwicklung problemadäquater Entscheidungsmodelle, die den Besonderheiten des Untersuchungsgegenstands Rechnung trägt. Die Methodik kombiniert auf innovative

Weise systemdynamische Simulation und multikriterielle Bewertung mit weiteren Methoden und ermöglicht so die fundierte Bewertung unterschiedlicher Strategien unter potenziellen Umweltszenarien. Gleichzeitig zeigt sie damit Handlungsoptionen für das Management auf. Eine Anwendung der Methodik am Praxisbeispiel von Nachtbelieferungen mit batterieelektrisch angetriebenen Lkw deckt auf, dass deren Implementierung bereits heute von Vorteil sein kann.

Development with Global Value Chains - Dev Nathan 2019-01-24

Examines upgradation and innovation by firms in GVCs through case studies of China, India, South Korea, the Philippines and Sri Lanka.

AIDS Drugs For All - Ethan B. Kapstein 2013-08-29

Uses the success of the AIDS treatment advocacy movement to show how social movements can successfully transform global markets.

Electrochemical Energy - Pei Kang Shen 2018-10-08

Electrochemical Energy: Advanced Materials and Technologies covers the development of advanced materials and technologies for electrochemical energy conversion and storage. The book was created by participants of the International Conference on Electrochemical Materials and Technologies for Clean Sustainable Energy (ICES-2013) held in Guangzhou, China, and incorporates select papers presented at the conference. More than 300 attendees from across the globe participated in ICES-2013 and gave presentations in six major themes: Fuel cells and hydrogen energy Lithium batteries and advanced secondary batteries Green energy for a clean environment Photo-Electrocatalysis Supercapacitors Electrochemical clean energy applications and markets Comprised of eight sections, this book includes 25 chapters featuring highlights from the conference and covering every facet of synthesis, characterization, and performance evaluation of the advanced materials for electrochemical energy. It thoroughly describes electrochemical energy conversion and storage technologies such as batteries, fuel cells, supercapacitors, hydrogen generation, and their associated materials. The book contains a number of topics that include electrochemical processes, materials, components, assembly and manufacturing, and degradation mechanisms. It also addresses challenges related to cost and performance, provides varying perspectives, and emphasizes existing and emerging solutions. The result of a conference encouraging enhanced research collaboration among members of the electrochemical energy community, *Electrochemical Energy: Advanced Materials and Technologies* is dedicated to the development of advanced materials and technologies for electrochemical energy conversion and storage and details the technologies, current achievements, and future directions in the field.

Materials for Advanced Packaging - Daniel Lu 2016-11-18

Significant progress has been made in advanced packaging in recent years. Several new packaging techniques have been developed and new packaging materials have been introduced. This book provides a comprehensive overview of the recent developments in this industry, particularly in the areas of microelectronics, optoelectronics, digital health, and bio-medical applications. The book discusses established techniques, as well as emerging technologies, in order to provide readers with the most up-to-date developments in advanced packaging.

Industrial Carbon and Graphite Materials - Wilhelm Frohs 2021-03-17

- Hochaktuelles Thema: Kohlenstoff- und Graphitmaterialien gehören aufgrund ihrer ausgezeichneten Eigenschaften und vielfältigen Anwendungsmöglichkeiten in unzähligen Bereichen, von der Nanotechnologie bis hin zur Elektronik, zu den interessantesten Verbindungsklassen. - Einzigartig und anwendungsorientiert: Es gibt viele Publikationen, die sich mit Materialien aus Kohlenstoff und Graphit beschäftigen. Dieses zweibändige Fachbuch gibt jedoch einen ausgezeichneten Überblick über Fertigung, Einsatz und Anwendung dieser Materialien in der Industrie. - Große Zielgruppe: Chemiker aus den Bereichen Elektrochemie (Li-Ionen-Batterien), Maschinenbau, Nukleartechnologie, Nanotechnologie, Katalyse, Keramik, Fasern, Polymere u.v.m. - Exzellentes Referenzwerk mit mehr als 1000 Seiten: von polygranularen Materialien bis zu Fullerenen, von Nanoröhren bis zu aktiviertem Kohlenstoff, alle wichtigen Kohlenstoff- und Graphitklassen werden behandelt.

Engines and Fuels for Future Transport - Gautam Kalghatgi 2021-12-13

This book focuses on clean transport and mobility essential to the modern world. It discusses internal

combustion engines (ICEs) and alternatives like battery electric vehicles (BEVs) which are growing fast. Alternatives to ICEs start from a very low base and face formidable environmental, material availability, and economic challenges to unlimited and rapid growth. Hence ICEs will continue to be the main power source for transport for decades to come and have to be continuously improved to improve transport sustainability. The book highlights the need to assess proposed changes in the existing transport system on a life cycle basis. The volume includes chapters discussing the challenges faced by ICEs as well as chapters on novel fuels and fuel/ engine interactions which help in this quest to improve the efficiency of ICE and reduce exhaust pollutants. This book will be of interest to those in academia and industry alike.

Prospects For Li-ion Batteries And Emerging Energy Electrochemical Systems - Croguennec Laurence 2018-02-27

The Li-ion battery market is growing fast due to its ever increasing number of applications, from electric vehicles to portable devices. These devices are in demand due to safety reasons, energy efficiency, high power density and long life duration, which drive the need for more efficient electrochemical energy storage systems. The aim of this book is to provide the challenges and perspectives for Li-ion batteries (chapters 1 and 2), at the negative electrode as well as at the positive electrode, and for technologies beyond the Li-ion with the emerging Na-ion batteries and multivalent (Mg, Al, Ca, etc) systems (chapters 4 and 5). The aim is also to alert on the necessity to develop the recycling methods of the millions of produced batteries which are going to further flood our societies (chapter 3), and also to continuously increase the safety of the energy storage systems. For the latter challenge, it is interesting to seriously consider polymer electrolytes and batteries as an alternative (chapter 6). This book will take readers inside recent breakthroughs made in the electrochemical energy systems. It is a collaborative work of experts from the most known teams in the batteries field in Europe and beyond, from academics as well as from manufacturers. Contents: Negative Electrodes for Li-Ion Batteries: Beyond Carbon (Phoebe K Allan, Nicolas Louvain and Laure Monconduit) Li-Rich Layered Oxides: Still a Challenge, but a Very Promising Positive Electrode Material for Li-Ion Batteries (Ségolène Pajot, Loïc Simonin and Laurence Croguennec) Recycling of Li-Ion Batteries and New Generation Batteries (Jean Scoyer) Na-Ion Batteries — State of the Art and Prospects (Patrik Johansson, Patrick Rozier and M Rosa Palacín) Battery Systems Based on Multivalent Metals and Metal Ions (Doron Aurbach, Romain Berthelot, Alexandre Ponrouch, Michael Salama and Ivgeni Shterenberg) Lithium Polymer Electrolytes and Batteries (Gebrekidan Gebresilassie Eshetu, Michel Armand and Stefano Passerini) Readership: Researchers and professionals in electrochemistry, materials chemistry/nanochemistry, inorganic chemistry, solid state chemistry and physical chemistry. Keywords: Battery;Li-ion;Na-ion;Mg-ion;Li Polymer;Energy;Recycling;ElectrochemistryReview: Key Features: Prominent authors or contributors who for some of them belong to the European Research Institute, Alistore ERI (headed by Dr M R Palacin (ICMAB, CSIC, Barcelona, Spain) and by Dr P Simon (CIRIMAT, University Paul Sabatier, Toulouse, France)), and more generally to prestigious European Institutes and Universities developing high level research in the field of the electrochemical energy storage Selected topics which highlight the main trends in the battery field, focusing especially on the emerging research axes Original approach with fundamental aspects (understanding of the mechanisms and failure mechanisms in batteries through the use of advanced characterization tools, often operandi during the cycling of the battery), as well as industrial concerns such as the recycling

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

Critical Mineral Resources of the United States - K. J. Schulz 2017

As the importance and dependence of specific mineral commodities increase, so does concern about their supply. The United States is currently 100 percent reliant on foreign sources for 20 mineral commodities and imports the majority of its supply of more than 50 mineral commodities. Mineral commodities that have important uses and face potential supply disruption are critical to American economic and national security. However, a mineral commodity's importance and the nature of its supply chain can change with time; a mineral commodity that may not have been considered critical 25 years ago may be critical today, and one considered critical today may not be so in the future. The U.S. Geological Survey has produced this volume to describe a select group of mineral commodities currently critical to our economy and security. For each mineral commodity covered, the authors provide a comprehensive look at (1) the commodity's use; (2) the geology and global distribution of the mineral deposit types that account for the present and possible future supply of the commodity; (3) the current status of production, reserves, and resources in the United States and globally; and (4) environmental considerations related to the commodity's production from different types of mineral deposits. The volume describes U.S. critical mineral resources in a global context, for no country can be self-sufficient for all its mineral commodity needs, and the United States will always rely on global mineral commodity supply chains. This volume provides the scientific understanding of critical mineral resources required for informed decisionmaking by those responsible for ensuring that the United States has a secure and sustainable supply of mineral commodities.

Technological Learning in the Transition to a Low-Carbon Energy System - Martin Junginger 2019-11-22

Technological Learning in the Transition to a Low-Carbon Energy System: Conceptual Issues, Empirical Findings, and Use in Energy Modeling quantifies key trends and drivers of energy technologies deployed in the energy transition. It uses the experience curve tool to show how future cost reductions and cumulative deployment of these technologies may shape the future mix of the electricity, heat and transport sectors. The book explores experience curves in detail, including possible pitfalls, and demonstrates how to quantify the 'quality' of experience curves. It discusses how this tool is implemented in models and addresses methodological challenges and solutions. For each technology, current market trends, past cost reductions and underlying drivers, available experience curves, and future prospects are considered. Electricity, heat and transport sector models are explored in-depth to show how the future deployment of these technologies--and their associated costs--determine whether ambitious decarbonization climate targets can be reached - and at what costs. The book also addresses lessons and recommendations for policymakers, industry and academics, including key technologies requiring further policy support, and what scientific knowledge gaps remain for future research. Provides a comprehensive overview of trends and drivers for major energy technologies expected to play a role in the energy transition Delivers data on cost trends, helping readers gain insights on how competitive energy technologies may become, and why Reviews the use of learning curves in environmental impacts for lifecycle assessments and energy modeling Features social learning for cost modeling and technology diffusion, including where consumer preferences play a major role

El oligopolio que domina el sistema eléctrico - Enrique Palazuelos 2019-12-12

Cinco grandes compañías eléctricas poseen la mayor parte de la capacidad instalada y de la energía producida en España, a la vez que controlan la totalidad de las redes de distribución y venden la mayor parte de la electricidad a los clientes finales. Forman un oligopolio que domina tanto el mercado mayorista como el minorista de energía eléctrica. De modo que el funcionamiento del sistema eléctrico constituye un negocio de colosales dimensiones, que proporciona grandes beneficios a esas grandes compañías, está garantizado por los poderes públicos y lo financian los consumidores. Consecuentemente, esa posición de poder es un factor determinante para calibrar las posibilidades y los límites del curso que pueda seguir la transición eléctrico-energética. Alrededor de la transformación del sistema eléctrico entran en juego cuestiones vitales para toda la sociedad, en las que se dilucida cómo garantizar el suministro de un producto fundamental, cómo evitar los precios abusivos y cómo contribuir a un drástico descenso de la

emisión de gases de efecto invernadero. Este trabajo pretende aportar una reflexión sobre lo que ha venido ocurriendo en el sistema eléctrico, como condición imprescindible para explicar sus características actuales y para afrontar el debate sobre qué transición, con qué prioridades y con qué actores cabe llevar a cabo la transformación del sistema. Después de un capítulo introductorio en el que se plantean las premisas básicas del análisis, el libro se estructura en dos partes que abordan la posición de poder del oligopolio eléctrico desde perspectivas complementarias. Una lo hace a través del dominio que ejercen en las diferentes tecnologías con las que se genera la electricidad. La otra lo hace a través del dominio que ejercen en los sucesivos segmentos (producción, distribución, comercialización) y los mercados (mayorista y minorista) que componen el sistema eléctrico. Por último, el capítulo final presenta un conjunto de consideraciones y propuestas acerca de la estrategia a seguir para transformar el sistema eléctrico. Las características que adopte la transición eléctrica dependerán fundamentalmente del acierto con que se fije y se aplique esa estrategia de transformación, guiada por objetivos económicos, sociales y ecológicos. Lo cual inevitablemente tendrá que ir acompañado de la solvencia con la que los poderes públicos (parlamento, gobierno, reguladores del mercado, garantes de la competencia) entablen una negociación "disputada" con las grandes compañías para que prevalezcan los intereses democráticos de la mayoría de la sociedad. Por consiguiente, el contenido del libro está orientado hacia un público interesado en conocer las características del sistema eléctrico, como condición imprescindible para valorar la envergadura de los desafíos pendientes y para participar en el debate sobre la transición eléctrica, energética y ecológica.

Advances in Lithium-Ion Batteries - Walter van Schalkwijk 2007-05-08

In the decade since the introduction of the first commercial lithium-ion battery research and development on virtually every aspect of the chemistry and engineering of these systems has proceeded at unprecedented levels. This book is a snapshot of the state-of-the-art and where the work is going in the near future. The book is intended not only for researchers, but also for engineers and users of lithium-ion batteries which are found in virtually every type of portable electronic product.

Critical Materials: Underlying Causes And Sustainable Mitigation Strategies - S Erik Offerman 2019-02-27

This book covers a new frontier of research in Critical Materials that provides insight in terms of the possible sustainable mitigation strategies, the complexity, broadness and multi-disciplinarity of the subject. By exploring in both 'systems view' and 'in-depth materials view' in light of the circular economy, this book tackles the problem of sustainable usage of materials that is closely intertwined with the energy issue and climate change. Topics covered include: geopolitics of materials, the energy-materials nexus, definitions of the criticality of materials, circular product design, the development of alternative materials (substitution), sustainable mining and recycling.

Mapping of lithium-ion batteries for vehicles: A study of their fate in the Nordic countries - Dahllöf, Lisbeth 2019-10-24

The number of electric vehicles (cars, buses, e-bikes, electric scooters and electric motorcycles) sold in the Nordic countries is currently increasing quickly. That means that more electricity is used for driving, and also that more of some important metals are being used than earlier. This report regards the fate of the lithium-ion batteries used in vehicles in the Nordic countries. Currently the "Battery Directive" (EC, 2006) which is a producer's responsibility directive, is under revision and this study is a knowledge base intended for use by the Nordic Environmental Protection Agencies for their referral response in the revision process. This report focuses on the aspect of metal resources, but it does not elaborate on a broader range of environmental impacts, as these were outside the scope of this study.

Lead-Acid Batteries: Science and Technology - D. Pavlov 2011-05-31

The book presents a comprehensive overview of the theory of the technological processes of lead-acid battery manufacture and their influence on battery performance parameters. It summarizes the current knowledge about the technology of lead-acid battery production and presents it in the form of an integral theory. This theory is supported by ample illustrative material and experimental data, thus allowing technologists and engineers to control the technological processes in battery plants and providing university lecturers with a toll for clear and in-depth presentation of the technology of lead-acid battery production in their courses. The relationship between the technological processes and the performance characteristics of the batteries is disclosed too. Disclosure of the structures of the lead and lead dioxide

active masses, ensuring reversibility of the processes during charge and discharge and thus long cycle life of the battery Proposal of optimum conditions for individual technological processes which would yield appropriate structures of the lead and lead dioxide active masses Disclosure of the influence of H₂SO₄ concentration on battery performance parameters Discussion of the processes involved in the closed oxygen cycle in VRLAB and the thermal phenomena leading to thermal runaway (TRA) Elucidation of the relationship between technology of battery manufacture and battery capacity and cycle life performance

Minerals Yearbook 2012 - Department of Interior 2016-12-15

This volume, covering metals and minerals, contains chapters on approximately 90 commodities. In addition, this volume has chapters on mining and quarrying trends and on statistical surveying methods used by Minerals Information, plus a statistical summary. Staff and contractors working for mining companies, companies that use export/import certain minerals and metals, geologists, and members of the general public interested in the properties and federal rules governing the definitions and extraction/use of minerals and metals. Additionally, economists, and commodity investors or financial planners may be interested in this volume. Related products: Minerals and Metals collection can be found here: <https://bookstore.gpo.gov/catalog/science-technology/minerals-metals> Mining & Drilling resources collection is available here: <https://bookstore.gpo.gov/catalog/science-technology/mining-drilling> Other printed volumes in the Mineral Yearbook series can be found here: <https://bookstore.gpo.gov/catalog/science-technology/minerals-metals/minerals-yearbook>

The Business of Healthcare Innovation - Lawton Robert Burns 2005-08-25

The Business of Healthcare Innovation is the first wide-ranging analysis of business trends in the manufacturing segment of the health care industry. In this leading edge volume, Professor Burns focuses on the key role of the 'producers' as the main source of innovation in health systems. Written by professors of the Wharton School and industry executives, this book provides a detailed overview of the pharmaceutical, biotechnology, genomics/proteomics, medical device and information technology sectors. It analyses the market structures of these sectors as well as the business models and corporate strategies of firms operating within them. Most importantly, the book describes the growing convergence between these sectors and the need for executives in one sector to increasingly draw upon trends in the others. It will be essential reading for students and researchers in the field of health management, and of great interest to strategy scholars, industry practitioners and management consultants.

Rare Earth Elements - Marc Humphries 2010-11

Contents: (1) Intro.; (2) What are Rare Earth Elements (REE)?; (3) Major End Uses and Applications: Demand for REE; The Application of REE in National Defense; (4) Rare Earth Resources and Production Potential; Supply Chain Issues; Role of China; (5) Rare Earth Legislation in the 111th Congress: H.R. 4866, and S. 3521, the Rare Earths Supply-Chain Technology and Resources Transformation Act of 2010; H.R. 5136, the FY 2011 Nat. Defense Authorization Act; P.L. 111-84, the FY 2010 Nat. Defense Authorization Act; (6) Possible Policy Options: Authorize and Appropriate Funding for a USGS Assessment; Support and Encourage Greater Exploration for REE; Challenge China on Its Export Policy; Establish a Stockpile. Illustrations.

High-Efficient Low-Cost Photovoltaics - Vesselinka Petrova-Koch 2009

A bird's-eye view of the developmental trends and problems of recent photovoltaics is presented. The worldwide effort to develop high-efficiency low-cost PV modules, making use of most efficient solar cells and clever low-cost solar concentrators is described.

Sustainability Through Innovation in Product Life Cycle Design - Mitsutaka Matsumoto 2016-09-19

This book consists of chapters based on selected papers presented at the EcoDesign2015 symposium (9th International Symposium on Environmentally Conscious Design and Inverse Manufacturing). The symposium, taking place in Tokyo in December 2015, has been leading the research and practices of eco-design of products and product-related services since it was first held in 1999. The proceedings of EcoDesign2011 were also published by Springer. Eco-design of products and product-related services (or product life cycle design) are indispensable to realize the circular economy and to increase resource efficiencies of our society. This book covers the state of the art of the research and the practices in eco-design, which are necessary in both developed and developing countries. The chapters of the book, all of

which were peer-reviewed, have been contributed by authors from around the world, especially from East Asia, Europe, and Southeast Asia. The features of the book include (1) coverage of the latest topics in the field, e.g., global eco-design management, data usage in eco-design, and social perspectives in eco-design; (2) an increased number of authors from Southeast Asian countries, with a greater emphasis on eco-design in emerging economies; (3) high-quality manuscripts, with the number of chapters less than half of that of the previous book.

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

Electrochemical Technologies for Energy Storage and Conversion, 2 Volume Set - JiuJun Zhang 2011-12-12

In this handbook and ready reference, editors and authors from academia and industry share their in-depth knowledge of known and novel materials, devices and technologies with the reader. The result is a comprehensive overview of electrochemical energy and conversion methods, including batteries, fuel cells, supercapacitors, hydrogen generation and storage as well as solar energy conversion. Each chapter addresses electrochemical processes, materials, components, degradation mechanisms, device assembly and manufacturing, while also discussing the challenges and perspectives for each energy storage device in question. In addition, two introductory chapters acquaint readers with the fundamentals of energy storage and conversion, and with the general engineering aspects of electrochemical devices. With its uniformly structured, self-contained chapters, this is ideal reading for entrants to the field as well as experienced researchers.

Recycling of Spent Lithium-Ion Batteries - Liang An 2019-10-15

This book presents a state-of-the-art review of recent advances in the recycling of spent lithium-ion batteries. The topics covered include: introduction to the structure of lithium-ion batteries; development of battery-powered electric vehicles; potential environmental impact of spent lithium-ion batteries; pretreatment of spent lithium-ion batteries for recycling processing; pyrometallurgical processing for recycling spent lithium-ion batteries; hydrometallurgical processing for recycling spent lithium-ion batteries; direct processing for recycling spent lithium-ion batteries; high value-added products from recycling of spent lithium-ion batteries; and effects of recycling of spent lithium-ion batteries on environmental burdens. The book provides an essential reference resource for professors, researchers, and policymakers in academia, industry, and government around the globe.

The Automobile Revolution - Danielle Attias 2016-10-01

This book discusses cars of the future and the new socio-economic paradigm that they represent. It examines the electromobility revolution in the traditional automotive industry and brings together multidisciplinary expertise to provide insights into the shift towards electromobility. New vehicular technologies may develop in various directions, including the smart car, and this context raises two important questions: will car manufactures maintain control over the industry? And if so, will they be able to come up with sufficiently radical innovations to steer us into the electromobility of tomorrow? One thing is certain: the transition to electromobility will be a revolution. The book's combined approach to understanding this complex reality enables readers to better visualize the possible future directions. It offers anyone interested in electromobility an excellent review of the subject and a useful roadmap to future developments.

Battery Reference Book - Thomas P J Crompton 2000-03-20

Crompton's Battery Reference Book has become the standard reference source for a wide range of professionals and students involved in designing, manufacturing, and specifying products and systems that use batteries. This book is unique in providing extensive data on specific battery types, manufacturers and suppliers, as well as covering the theory - an aspect of the book which makes an updated edition important for every professional's library. The coverage of different types of battery is fully comprehensive, ranging from minute button cells to large installations weighing several hundred tonnes. Must-have information and data on all classes of battery in an accessible form Essential reference for design engineers in automotive and aerospace applications, telecommunications equipment, household appliances, etc. Informs you of developments over the past five years

Energy Technology 2020: Recycling, Carbon Dioxide Management, and Other Technologies - Xiaobo Chen 2020-01-15

This collection addresses the pressing needs for sustainable technologies with reduced energy consumption and environmental pollutions and the development and application of alternative sustainable energy to maintain a green environment and efficient and long-lasting energy supply. Contributors represent both industry and academia and focus on new and efficient energy technologies including innovative ore beneficiation, smelting technologies, and recycling and waste heat recovery, as well as emerging novel energy solutions. The volume also covers a broad range of mature and new technological aspects of sustainable energy ecosystems, processes that improve energy efficiency, reduce thermal emissions, and reduce carbon dioxide and other greenhouse emissions. Authors also explore the valorization of materials and their embodied energy including byproducts or coproducts from ferrous and nonferrous industries, batteries, electronics, and other complex secondary materials.

Electrochemical Storage Materials - Dirk C. Meyer 2018-12-17

This work gives a comprehensive overview on materials, processes and technological challenges for electrochemical storage and conversion of energy. Optimization and development of electrochemical cells requires consideration of the cell as a whole, taking into account the complex interplay of all individual components. Considering the availability of resources, their environmental impact and requirements for recycling, the design of new concepts has to be based on the understanding of relevant processes at an atomic level.

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.

Recycling of Lithium-Ion Batteries - Arno Kwade 2017-12-12

This book addresses recycling technologies for many of the valuable and scarce materials from spent lithium-ion batteries. A successful transition to electric mobility will result in large volumes of these. The book discusses engineering issues in the entire process chain from disassembly over mechanical conditioning to chemical treatment. A framework for environmental and economic evaluation is presented and recommendations for researchers as well as for potential operators are derived.

Digitizing Production Systems - Numan M. Durakbasa 2021-11-10

This book contains selected papers from International Symposium for Production Research 2021, held on October 7-9, 2021, online, Turkey. The book reports recent advances in production engineering and operations. It explores topics including production research; production management; operations management; industry 4.0; industrial engineering; mechanical engineering; engineering management; and operational research. Presenting real-life applications, case studies, and mathematical models, this book is of interest to researchers, academics, and practitioners in the field of production and operation engineering. It provides both the results of recent research and practical solutions to real-world problems.

Solar Photovoltaic System Applications - Parimita Mohanty 2015-10-30

Presenting a complete guide for the planning, design and implementation of solar PV systems for off-grid applications, this book features analysis based on the authors' own laboratory testing as well as their in the field experiences. Incorporating the latest developments in smart-digital and control technologies into the design criteria of the PV system, this book will also focus on how to integrate newer smart design approaches and techniques for improving the efficiency, reliability and flexibility of the entire system. The design and implementation of India's first-of its-kind Smart Mini-Grid system (SMG) at TERI premises, which involves the integration of multiple renewable energy resources (including solar PV) through smart controllers for managing the load intelligently and effectively is presented as a key case study. Maximizing reader insights into the performance of different components of solar PV systems under different operating conditions, the book will be of interest to graduate students, researchers, PV designers, planners, and practitioners working in the area of solar PV design, implementation and assessment.

Advanced Battery Development - 1989

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.

The Effects of Internal Stress and Lithium Transport on Fracture in Storage Materials in Lithium-Ion Batteries - Klinsmann, Markus 2016-03-08