Hydrogen, Batteries and Fuel Cells: Jane S. Gibbs - 2010-06-01

The book begins with an introduction to adiabatic processes that occur in fuel cells and batteries. It then describes the fundamental concepts of energy conversion, including the fuel cell and battery working principles. It also covers the current state of the art for fuel cell designs, including the technology of fuel cell manufacturing, and discusses the potential for future developments.

Energy Storage Systems: Principles and Technologies: A. Ang - 2010-06-10

This book provides a comprehensive introduction to the principles and technologies of energy storage systems. It covers the basic concepts of energy storage, including the types of systems used, their properties, and their applications. It also discusses the current state of the art for energy storage technologies, including batteries, supercapacitors, and fuel cells.

Encyclopedia of Electrochemical Power Sources: A. Ang - 2010-05-24

This book is a comprehensive reference work on the topic of electrochemical power sources. It covers a wide range of topics, including batteries, fuel cells, and supercapacitors. It also includes information on the fundamentals of electrochemical power sources, as well as specific applications and developments in the field.

Electrochemical Power Sources: Fundamentals, Systems, and Applications: J. P. Zhang - 2010-04-01

This book provides a comprehensive overview of the fundamentals, systems, and applications of electrochemical power sources. It covers a wide range of topics, including batteries, fuel cells, and supercapacitors. It also includes information on the fundamentals of electrochemical power sources, as well as specific applications and developments in the field.

Electrochemical Power Sources: The Ecs Series of Texts and Monographs: J. P. Zhang - 2010-04-01

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Flow batteries have received attention in large-scale energy storage due to their flexible design, high safety, high energy efficiency, and environmental friendliness. In recent years, they have been rapidly developed and tested in a variety of scales that prove their feasibility and advantages of use. As energy becomes a global focus, it is important to consider flow battery systems. This book offers a detailed introduction to the function of different kinds of redox flow batteries, their operating principles, systems, materials, and applications serves as a primary source of reference for electrochemists, materials scientists, and energy technologists, and engineers who operate or manufacture batteries, with timely coverage of current developments.

Handbook on Battery Energy Storage System

This handbook serves as a guide to deploying battery energy storage technologies, specifically for distributed energy resources and flexibility resources. Battery energy storage technology is the most promising, rapidly developed technology as more and more nations turn to renewable energy systems. However, the rapidly growing installed capacity has also increased the need for analytical tools to understand, predict, and mitigate the effects of variability and uncertainty in the distribution of energy. Energy storage systems enable the provision of flexible and reliable electrical power to support the grid over a range of time scales.

Microfluidic Fuel Cells and Batteries

This book describes the current status and future development of microfluidic fuel cells and batteries. It provides a comprehensive overview of microfluidic electrochemical devices, including microfabrication techniques, materials, and applications. Chapters provide a comprehensive overview of the development and commercialization of microfluidic devices, including microfabrication techniques, materials, and applications. Chapters provide a comprehensive overview of the development and commercialization of microfluidic devices, including microfabrication techniques, materials, and applications.

Energy Storage Systems in Electronics

This volume illustrates the technological advances made in recent years in the development of battery and other energy storage systems. Discussions of present and near future battery technologies are included as well as emerging energy technologies that have the potential to impact on the electronics industry as well. This book should be a valuable resource for those interested in the development and commercialization of energy storage technologies.

Fuel Cell Fundamentals

Fuel cell technology is rapidly advancing and an increasing number of applications are under development, with a large potential market anticipated for transport, stationary, and remote-generation systems. This handbook provides a comprehensive overview of the key concepts, principles, and technologies required for the successful development and deployment of fuel cell systems.

Materials for Electrochemical Energy Storage Devices

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How will we meet rising energy demands? What are our options? Are there viable long-term solutions for the future? Learn the fundamental physical, chemical and materials science at the heart of: • Renewable/non-renewable energy sources • and sustainability. Leading experts provide comprehensive coverage of each topic, bringing together diverse subject matter by integrating theory with engaging insights. Each chapter includes helpful features to aid understanding, including a historical overview to provide context, suggested further reading and questions for discussion. Every subject is beautifully illustrated and brought to life with full color images and color-coded sections for easy browsing, making this a complete educational package. Fundamentals of Materials for Energy and Environmental Sustainability will satisfy today's scientists and educate future generations.

Fundamentals of Materials for Energy and Environmental Sustainability — David S. Ginley — 2011-11-30

Metal-Air and Metal-Sulfur Batteries

Metal-air and metal-sulfur batteries (MABs/MSBs) represent one of the most efficient energy storage technologies, with high round trip efficiency, a long life cycle, fast response at peak demand/supply of electricity, and decreased weight due to the use of atmospheric oxygen as one of the main reactants. This book presents an overview of the main MABs/MSBs from fundamentals to applications. Recent technological trends in their development are reviewed. It also offers a detailed analysis of these batteries at the material, component, and system levels, allowing the reader to evaluate the different approaches of their implementation. The book provides a systematic overview of the components, design, and integration, and discusses current technologies, achievements, and challenges, as well as future directions. Each chapter focuses on a particular battery type including zinc-air batteries, lithium-air batteries, aluminum-air batteries, magnesium-air batteries, lithium–sulfur batteries, and vanadium–air redox flow batteries, and metal–sulfur batteries. Problems are posed every advanced topic to foster systematic review batteries. Materials science, chemistry, and technology for novel, sustainable energy storage technologies such as MABs, MSBs, and conversion systems are covered in depth. This book includes a review of the historical development to inherent scientific and engineering problems and their commercialization and applications. The editions add two new chapters, one on structural and wetting properties of porous fuel cell components and the other on fuel cells with co-fed metal supply, and update all chapters with current knowledge for each topic.

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