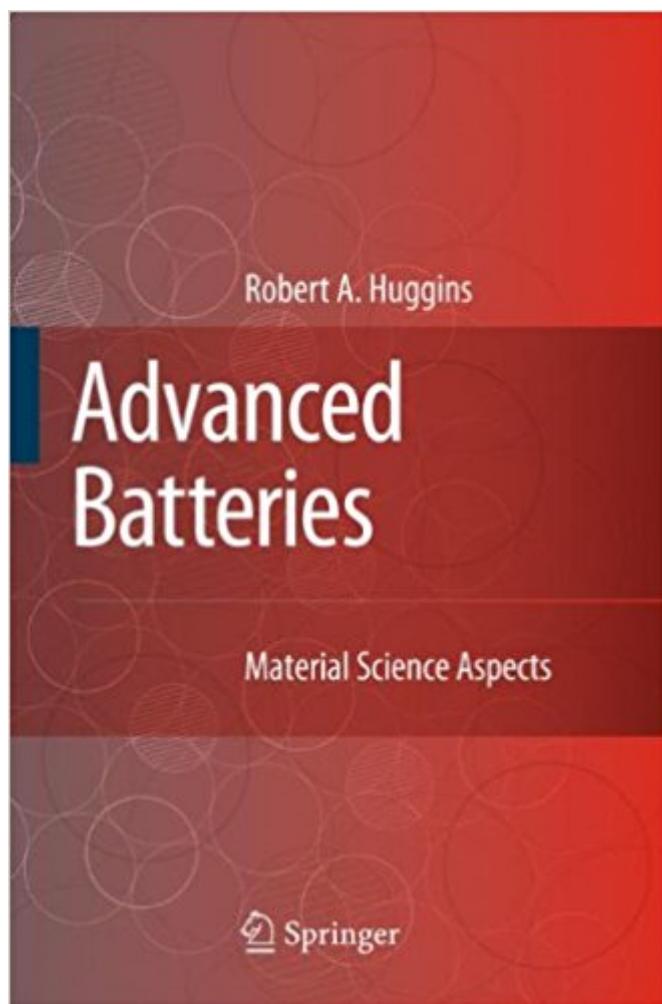


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# Advanced Batteries: Materials Science Aspects



## Synopsis

Storage and conversion are critical components of important energy-related technologies. "Advanced Batteries: Materials Science Aspects" employs materials science concepts and tools to describe the critical features that control the behavior of advanced electrochemical storage systems. This volume focuses on the basic phenomena that determine the properties of the components, i.e. electrodes and electrolytes, of advanced systems, as well as experimental methods used to study their critical parameters. This unique materials science approach utilizes concepts and methodologies different from those typical in electrochemical texts, offering a fresh, fundamental and tutorial perspective of advanced battery systems. Graduate students, scientists and engineers interested in electrochemical energy storage and conversion will find "Advanced Batteries: Materials Science Aspects" a valuable reference.

## Book Information

Hardcover: 474 pages

Publisher: Springer; 2009 edition (December 10, 2008)

Language: English

ISBN-10: 9780387764238

ISBN-13: 978-0387764238

ASIN: 0387764232

Product Dimensions: 6.1 x 1.1 x 9.2 inches

Shipping Weight: 2 pounds (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 stars 5 customer reviews

Best Sellers Rank: #796,053 in Books (See Top 100 in Books) #29 in Books > Science & Math > Chemistry > Physical & Theoretical > Electrochemistry #34 in Books > Science & Math > Chemistry > Electrochemistry #260 in Books > Science & Math > Physics > Solid-State Physics

## Customer Reviews

From the reviews: "This book is not at all one more standard textbook on batteries, starting with some thermodynamic and kinetic electrochemistry and continuing with the well-known review of established, emerging, and desired batteries. It is something entirely different. The book is a must for materials scientists in the field of secondary batteries, and it may indeed be a tutorial for the most patient reader. It is a highly recommended book." (R. Holze, Journal of Solid State Electrochemistry, Vol. 17, 2013) "This book is an excellent introduction to the

field of advanced batteries for the newcomer to the field. It will not be outdated for a long time, as it is written from the point of view of the basics.  I can recommend without hesitation this book to all interested in batteries, and particularly to those entering the field. It is written at a level appropriate to someone with a chemistry, physics, or materials background. (Stan Whittingham, MRS Bulletin, Vol. 37 (3), March, 2012) "This timely book focuses on the materials science principles of advanced battery technology.  Extensive reference lists, a summary, and many illustrations and graphs are provided for each chapter, with the author bringing great technical insight to bear on the subject.  This book is an outstanding technical resource on advanced battery technology for students or researchers . It will definitely help to advance battery technology by providing new researchers with the tools and ideas necessary to develop the next generation of batteries. (IEEE Electrical Insulation Magazine, 2010)

Storage and conversion are critical components of important energy-related technologies. Advanced Batteries: Materials Science Aspects employs materials science concepts and tools to describe the critical features that control the behavior of advanced electrochemical storage systems. This volume focuses on the basic phenomena that determine the properties of the components, i.e. electrodes and electrolytes, of advanced systems, as well as experimental methods used to study their critical parameters. This unique materials science approach utilizes concepts and methodologies different from those typical in electrochemical texts, offering a fresh, fundamental and tutorial perspective of advanced battery systems. Graduate students, scientists and engineers interested in electrochemical energy storage and conversion will find Advanced Batteries: Materials Science Aspects a valuable reference.

I have an undergrad cheme degree and this book was very helpful in bringing me up the curve on new battery technology. At times it was a little overwhelming but in the end I came away with a solid understanding of electrochemical systems. It is also not clouded by political rhetoric often associated with literature on clean energy. I highly recommend this book to anyone with an engineering background looking to learn about advanced batteries.

The product was as expected. The service was great.

This book is different from the other books related to batteries for several reasons. One is that it was all written by one author, rather than being a collection of chapters written by different authors.

Multi-author books often have little coordination and continuity between the different topics, and are written with different assumptions about the level of understanding of the reader. There are often inconsistencies in the symbols and nomenclature used. An important feature is that it is focussed upon giving the reader an understanding of the basic materials science principles that determine the voltages, capacities and kinetic behavior of the components in different types of electrochemical power sources, rather than providing only a simple description of their properties. Because of its clarity, organization and tutorial flavor, this book should be especially valuable for students, engineers, and scientists who are interested in learning about this important and dynamic field.

"Advanced Batteries" by Robert A. Huggins is a stunningly comprehensive book about batteries. The books focus on basic principles will allow it to remain relevant for years to come as a valuable study guide for students, scientists and engineers who are interested in battery development. The book is based on materials science, and emphasizes the thermodynamic aspects of batteries, which allows readers from fields other than electrochemistry to understand the underlying principles. As energy storage becomes increasingly important in our society, especially for portable electronics, e.g., mobile phones, laptop computers, and cordless tools, and for electric vehicles, we can expect increasing interest in advanced batteries. This book will be a valuable guide as the field advances. I thoroughly enjoyed reading this book and I highly recommend it to other readers who share my interest in advanced batteries.

This book is well written and organized. The author provides very clear explanations and thinking tools in order to enhance the understanding of batteries and their materials. This book is a highly valuable source for students as well as for experienced engineers and scientists. I highly recommend this book to virtually anyone who is interested in advanced electrochemical energy storage.

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