



Lithium-Ion Batteries: Fundamentals and Applications (Electrochemical Energy Storage and Conversion)

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Lithium-Ion Batteries: Fundamentals and Applications offers a comprehensive treatment of the principles, background, design, production, and use of lithium-ion batteries. Based on a solid foundation of long-term research work, this authoritative monograph:

- Introduces the underlying theory and history of lithium-ion batteries
- Describes the key components of lithium-ion batteries, including negative and positive electrode materials, electrolytes, and separators
- Discusses electronic conductive agents, binders, solvents for slurry preparation, positive thermal coefficient (PTC) materials, current collectors, and cases
- Examines the assembly processes and electrochemical performance of lithium-ion batteries
- Explores applications in power tools, electric vehicles, aerospace, and more

Lithium-Ion Batteries: Fundamentals and Applications delivers a systematic overview of lithium-ion batteries, from physical properties to manufacturing technologies. The book also supplies valuable insight into potential growth opportunities in this exciting market.

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Lithium-Ion Batteries: Fundamentals and Applications (Electrochemical Energy Storage and Conversion) From CRC Press Bibliography

- Sales Rank: #1849086 in Books
- Published on: 2015-04-24
- Original language: English
- Number of items: 1
- Dimensions: 1.30" h x 6.20" w x 9.20" l, 2.82 pounds
- Binding: Hardcover
- 582 pages

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Review

"... offers a comprehensive and systematic coverage of the operating principles, underlying theory, design, production, and use of Li-ion batteries. ... Featuring a deep analysis of newly developed and predicted future developments in Li-ion batteries, this book fosters further discussion, research, and development, and is valuable for teachers, undergraduate and graduate students, industry professionals, and researchers in the field of rechargeable batteries and electrochemistry."

?Fernando A. Silva, Instituto Superior Técnico, Universidade de Lisboa, Portugal, from *IEEE Industrial Electronics Magazine*, March 2016

"... presents the most important cathode materials, technologies, and present knowledge and understanding of lithium-ion batteries. ... useful to students and researchers interested in the direct conversion of chemical energy into electrical energy."

?Ru-Shi Liu, National Taiwan University, Taipei

"... provides a very good balance between the basic and practical aspects of batteries. It addresses important engineering aspects which are missing in many other books."

?Doron Aurbach, Bar-Ilan University, Ramat Gan, Israel

"... covers the full range of aspects related to lithium-ion batteries, from fundamentals and historical background to the present state of knowledge and application, including current trends and future options. ... a must for those already keeping a collection of books on the subject, ... [yet] particularly accessible for beginners and novices."

?Rudolf Holze, Technische Universität Chemnitz, Germany

"... offers the cutting-edge fundamentals and technologies in the area of lithium-ion batteries. It covers the major components of lithium-ion batteries, i.e., cathode, anode, separator, and electrolyte. It also provides the latest information on lithium-ion batteries that is easy yet vital for students, engineers and researchers. Consequently, it could be an informative resource for those who are interested in this area."

?Shi Xue DOU, University of Wollongong

About the Author

Yuping Wu received his Ph.D from the Institute of Chemistry, Chinese Academy of Science, Beijing, and conducted his postdoctoral research at Tsinghua University, Beijing, China. He has been a visiting researcher at Waseda University, Tokyo, Japan; a Humboldt fellow at Technische Universität Chemnitz, Germany; and a full professor in the Department of Chemistry, Fudan University, Shanghai, China. Widely published and highly decorated, Dr. Wu is currently affiliated with the College of Energy, Nanjing Tech University, China. A popular speaker, he has served as co-chair of the International Union of Pure and Applied Chemistry International Conference on Novel Materials and their Synthesis, as well as an advisory board member for several journals.

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