



Electrochemical Energy: Advanced Materials and Technologies (Electrochemical Energy Storage and Conversion)

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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.

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Editorial Review

Review

"It covers a wide range of topics in the area of electrochemical energy storage and conversion ... It can be used as a reference for courses on energy storage and conversion. It can also be used as a reference for researchers in the field of electrochemical energy storage and conversion."

?Meilin Liu, Georgia Institute of Technology, Atlanta, USA

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?Hasuck Kim, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea

About the Author

Pei Kang Shen obtained his BSc in electrochemistry at Xiamen University in 1982. He received his PhD in chemistry at Essex University in 1992. From then on, he has been working at Essex University, Hong Kong University, the City University of Hong Kong, and the South China University of Technology. Since 2001, he has served as a professor and director of Advanced Energy Materials Research Laboratory at the Sun Yat-sen University, Guangzhou, China. He is the author of more than 300 publications. His research interests include fuel cells and batteries, electrochemistry of nanomaterials and nanocomposite functional materials, and electrochemical engineering.

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named by Thomas Reuter in 2014. His research interests cover the transport, materials, manufacturing, and modeling aspects of batteries and fuel cells.

San Ping Jiang obtained his BEng in ceramic materials from South China University of Technology in 1982 and PhD in electrochemistry from The City University, London, in 1988. He is a professor at the Department of Chemical Engineering, deputy director of Fuels and Energy Technology Institute, Curtin University, Australia, and adjunct professor at University of the Sunshine Coast, Australia. Dr. Jiang has authored and coauthored 10 book chapters and three books, and published approximately 270 journal papers. His research interests encompass solid oxide fuel cells, proton-exchange membrane and direct alcohol fuel cells, water electrolysis, solid-state ionics, electrocatalysis, and nanostructured functional materials.

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Jiujun Zhang is a principal research officer at the National Research Council of Canada and a fellow of the International Society of Electrochemistry. His expertise lies in electrochemistry, photoelectrochemistry, spectroelectrochemistry, electrocatalysis, fuel cells (polymer electrolyte membrane fuel cells, solid oxide fuel cells, and direct methanol fuel cells), batteries, and supercapacitors. Dr. Zhang received his BS and MSc in electrochemistry from Peking University in 1982 and 1985, respectively, and his PhD in electrochemistry from Wuhan University in 1988. He serves as the editor/editorial board member for several journals and as series book editor for *Electrochemical Energy Storage and Conversion*, CRC Press.

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