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Journal of Power Sources 89 (2000) 127

JOURNAL OF  
**POWER  
SOURCES**

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## Preface

The publication of this special issue of the Journal of Power Sources coincides with intense international interest in rechargeable lithium batteries. Research topics representative of some of the most active areas of study include lithium-ion batteries, lithium polymer batteries, and the numerous technical and theoretical aspects integral to these complex systems.

The fascination with rechargeable lithium batteries is driven by their potential superior performance (in particular, their exceptionally high energy density, especially lithium polymer), by environmental necessity, and by the fundamental challenges these technologies present. The most immediate applications for rechargeable lithium batteries are for consumer electronics and for electric and hybrid electric and hybrid vehicles. The general consumer market for rechargeable batteries is quite large and rapidly growing. The electric and hybrid vehicle market is less defined, but has enormous potential in terms of size and benefits to mankind.

However, the design and optimization of batteries is very complex due to the large number of requirements that must be met simultaneously. The papers in this proceedings volume are representative of the blend of science and engineering that is needed to create advanced batteries for specific applications.

The papers in this Advanced Lithium Solid State Battery Workshop cover a wide variety of topics related to the chemistry and technology requirements of the battery systems under development. The major areas of technical emphasis include modeling, new electrolytes (polymers in particular), interfaces and SEI characterization, and lithium ion transport. These papers present recent findings and thinking of the scientists working in this challenging field.

It is hoped that the papers will aid the reader in gaining a better understanding of some of the complex issues involved in the development of the new battery technologies.

DOE management is taking the technical results of this conference, and the technical and programmatic recommendations of the participants, into consideration in its planning processes. It plans utilize them to ensure that their programs and continued support to the scientific community yield the most useful results possible for battery developers and researchers.

Appreciation is extended to the US Department of Energy's Office of Transportation Technologies and the Office of Science for their support for this conference and the publication of this proceeding. The editors also wish to thank the authors for their efforts in the preparation and presentation of their manuscripts and the referees in their review of the papers in this volume. We thank Ms. Wendy Walker, Abacus Technology, for her efforts in making this symposium and special issue possible. We finally take this opportunity to thank the Chairmen of sessions, the speakers, and the attendees, for making this conference an interesting and stimulating event.

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