

Special issue to “ICMAT 2011, Symposium N: Advanced materials for energy storage systems—from fundamentals to applications, June 26–July 1, 2011, Singapore”

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For the sixth time, MRS-Singapore in association with the National University of Singapore (NUS), Nanyang Technological University, Institute of Materials Research and Engineering and various other national and international institutes organised the biennial International Conference on Materials for Advanced Technologies (ICMAT) from 26 June to 1 July 2011 at the SUNTEC Singapore International Convention and Exhibition Centre. ICMAT 2011 was inaugurated by the Singapore Minister for Trade and Industry, Lim Hng Kiang, the President of NUS Tan Chorh Chuan, and B.V.R. Chowdari, Organizing Chair of ICMAT 2011. The event was attended by more than 3,000 scholars, researchers and practitioners from 67 countries presenting over 3,600 scientific contributions. A wide range of frontier

areas in materials science and technology from graphene, topological insulators and various other nanostructures; via metamaterials; experimental and computational tools for materials characterisation to materials solutions for the harvesting, storage and use of renewable energy, as well as biochemistry and biomedical applications were covered in the 40 symposia and 9 plenary talks, of which 4 were given by the Nobel laureates Albert Fert, Ada Yonath, Klaus von Klitzing and Andre Geim.

Symposium N on “Advanced Materials for Energy Storage Systems” provided a high-quality interdisciplinary forum addressing recent trends of science and technology related to materials for energy storage and power sources. With the participation of 183 scientists, sharing their

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progress in 27 invited talks, 82 oral contributions and 76 poster presentations, a record participation was achieved both among the symposia of ICMAT 2011 and when compared to earlier ICMAT symposia on related topics. In his opening address, Chair Stefan Adams particularly extended his welcome to the large group of participants from Japan, who attended the symposium despite the devastating earthquake that had struck their home region in March 2011.

While one of the two parallel sessions mostly focused on novel electrode and electrolyte materials for high-performance lithium ion batteries or the optimal system integration, the second session covered all solid-state batteries, supercapacitors and ceramic fuel cells as well as chemical energy storage and novel systems beyond lithium ion batteries including metal–air, lithium–sulphur and redox flow batteries. Throughout the symposium, special emphasis was devoted to bringing together leading scientists advancing our fundamental understanding of new electrode and electrolyte materials, their processing and characterization with application-oriented researchers that optimize materials by nanostructuring, defect or interface engineering for the integration in high-performance devices and engineers that utilize the materials to realise the next generation of energy storage devices with high energy and power density and improved safety for key applications such as electric vehicles and the grid integration of renewable energy sources. Kicking off symposium N, Gerbrand Ceder (Massachusetts Institute of Technology)

addressed from a combination of first-principles calculations and molecular dynamics simulations the question how to understand and further improve the transformation rates in LiFePO_4 and other fast two-phase Li-ion battery cathode systems and introduced the Materials Project database he founded to facilitate data-mining scientific trends in materials properties as a basis for designing materials with tailored properties.

On behalf of the organising committee, we would like to thank all the invited and contributing speakers, session chairs, the lively audience and the sponsoring agents for the success of Symposium N of ICMAT 2011 as a whole. The present special proceedings issue of the *Journal of Solid State Electrochemistry* comprises a selection of peer-reviewed contributions presented during the symposium. Thanks to all the authors who have submitted their manuscripts within the due date and to the reviewers for their valuable suggestions and comments to improve the quality of the manuscripts. We also thank the Editor-in-Chief, Prof. Fritz Scholz, for the timely release of the online first publication and the publication of the proceedings volume in a short period of time. Three best poster awards were selected based on the recommendation of jury members, and the awardees were given the opportunity to present their results orally on the final day of the conference. Finally, we take this opportunity to express our deep appreciation and thanks to the symposium assistants and the event manager for their assistance in the conference logistics.