



Preface for the IBA-HBC 2006

The Joint Meeting of International Battery Association and Hawaii Battery Conference 2006 (IBA-HBC 2006) was held on the Kona–Kohala Coast on the northwest side of the Big Island of Hawaii at the Waikoloa Beach Marriott Resort during January 9–12, 2006. This is the second joint meeting between the two organizations, after the first one in 2003. IBA-HBC 2006 focuses on materials for both aqueous and nonaqueous systems and concepts directed at new and advanced topics relating to electrochemical energy conversion and storage. Topics are broad in nature; covering fundamental and applied aspects on electrode and electrolyte materials for advanced systems including primary and secondary batteries, fuel cells, and double layer capacitors. A special IBA symposium on manganese-based materials was also organized as part of the technical program. The conference consists of invited papers as well as papers and posters offered by the attendees. There are 56 oral presentations made in the four-day meeting besides two poster sessions. This volume is a collection reflecting some of the contributions selected. Since the conference was held at a secluded venue for the meeting, many participants found themselves in an atmosphere similar to that of a Gordon Research Conference along with the gracious Hawaii's rich heritage. The ambience stimulates free discussions in a natural and relaxed setting, enhancing experiences of cordial information exchanges.

In the first day's morning session, the presentations were primarily focused on the overview of the recent battery developments. Professor Stanley Whittingham gave a talk on recent trends in phosphate and oxide cathodes for lithium batteries. James Barnes presented the research and development efforts of the United States Department of Energy related to energy storage for hybrid electric vehicles. Dr. George Blomgren provided some insights to the high power lithium ion battery developments. Clinton S. Winchester of Naval Surface Warfare Center, Carderock Division, discussed the influence of modern electrochemical power systems on deployable system's design, mission capabilities, and platform integration for the U.S. Navy. Dr. Ralph Brodd presented his IBA Yeager Award presentation on "Future directions in electrochemical energy conversion: into the crystal ball dimly", and our congratulations to him for a well-deserved recognition. Dr. Gopal Rao talked about the NASA/Goddard Space Flight Center battery activities. Dr.

Patrick T. Moseley gave a wonderful overview of the program in Advanced Lead Acid Battery Consortium (ALABC) on Fick, Peukert, and VRLA batteries for hybrid electric vehicles. Michael Fetcenko discussed recent advances in Ni-MH battery technology. This series of presentations ran up to a very informative session for the conference.

The program of the conference then went to a series of technical presentations from primary Li cells to secondary rechargeable batteries, catalysis in fuel cells, electrode materials, hybrid configurations for batteries and double layer capacitors, to testing and evaluation techniques. The breadth and depth of the presentation is quite extraordinary and very informative.

Besides the IBA Yeager Award, an IBA Research Award and an IBA Technology Award were honored in the meeting. The IBA Research Award was given to Dr. Christopher S. Johnson of the Argonne National Laboratory for his contributions in the development and utilization of manganese oxides as cathodes in lithium batteries. Dr. Kazunori Ozawa was recognized as the recipient of the IBA Technology Award for his involvement and the pioneer work in the development of the Sony lithium ion battery technology in the early 1990s.

An IBA special symposium on manganese-based materials was held on January 10, 2006. Several exciting presentations on various forms of manganese oxide-based electrode materials, including those compositions in the $\text{Li}(\text{Ni-Mn-Co})\text{O}_2$ families (e.g., Delmas et al., Thackeray et al., Son and Cairns, Meng et al.); spinel (e.g., Kostecki et al., Yazami et al.), layered (e.g., Doeff and Park), electrolytic manganese dioxide (e.g., Morton et al., Donne et al.), and new compositions (Bowden et al.), for either battery or capacitor (e.g., Guyomard et al., Wu et al.) applications, were presented in the symposium.

The attractive LiFePO_4 chemistry for lithium ion batteries was discussed by Yamada et al., Ravet et al., Dokko et al., and Zaghbi et al. There are other notable advancements in battery R&D, including work on $\text{Li}/(\text{CF}_x)_n$ primary (Nagasubramanian and Sanchez), Li-S (Mikhaylik et al.), and Li metal (Visco et al.) for Li-air and Li-water configurations. Contributions to electrolytes (e.g., Wakihara et al., Amine et al., Smart et al., and Xu et al.), additives (Moeller et al.), anode materials (e.g., Abe et al., Lee et al., Spahr et al., Gao et al., Doublet et al., Edström et al.), and cathode materials (e.g., Guyomard et al., Yamaki et al.), and additional contributions to safety (Kida et al.), cell

design and processing (Perner et al., Yang et al., Yoshio et al., Besenhard et al.), interface stability (Winter et al., Aurbach et al.), and other issues related to electrode behavior (Huggins, Stux et al., Dubarry et al., Wang et al.) were also very informative in providing insightful discussions.

There are some presentations devoted to fuel cells, including microbial (Ringeison et al.), non-Pt electrocatalysis (Zelenay et al.), enzymatic (Svoboda et al.), and $\text{NaBH}_4/\text{H}_2\text{O}_2$ fuel cells (Miley et al.). These presentations are intriguing in their own perspective, adding unique flavors to this meeting.

The organizers of this meeting would like to thank the contributions from the presenters who made this meeting so successful and memorable. The participation of everyone in the meeting has been wonderful, making this meeting so enjoyable. The support and encouragement from the IBA executive committee and the HBC technical advisory committee are also highly appreciated. We would also like to thank the generous sponsorship from TIM-CAL in providing partial support to the banquet. Ms. Yvonne Yamashita of the University of Hawaii has provided wonderful services to the logistic arrangement and administrative support of the conference, allowing us to run the meeting very smoothly. The Marriot hotel staff have also provided a wonderful service, particular on a few incidental events. Their dedication is appreciated. The editorial office staff, under the guidance of Dr. Pat

Moseley, has been working hard to make this issue possible. Their assistance is much appreciated by the authors and the organizers.

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