

Connecticut Global Fuel Cell Center (CGFCC) Seminar Announcement

Seminar Topic: Advanced Electrochemical Energy Storage and Materials Challenges
Presented by: Dr. Z. Gary Yang, Pacific Northwest National Laboratory, Richland WA
Date: January 26, 2009
Time: 10:00 -11:00 AM
Location: CGFCC Conference Room

Abstract: The environmental concerns and constraints of the fossil fuels, combined with energy security concerns, have spurred ever increasing interest in efficient and renewable economy. The transition from fossil to the sustainable future however cannot be realized without effective energy storage. While being abundant and potentially readily available, renewable power from solar and wind is uncontrolled and variable. An effective approach to smooth out the intermittency of renewable energy and make it dispatchable is by the use of energy storage that is also needed to satisfy the increasing demand of high quality power by the modern society. Also, improved electrical storage systems are critical to the progress of today's hybrid electric vehicles as well as for the plug-in hybrids or all electric vehicles that are forthcoming in the near future. Among the most promising storage technologies for the stationary and transportation applications are electrochemical storage technologies or batteries that convert electrical energy into chemical energy or vice versa. Nevertheless most of the battery technologies are not yet technically and economically feasible for the applications. The performance improvement of the electrochemical devices and reduction in cost rely on progress in advanced materials development. As thus PNNL has carried out wide research and development of electrochemically active materials and components for varied battery technologies. This presentation will discuss the need of electrochemical storage for stationary and transportation applications, status and challenges of potential technologies, and progress of related research activities at PNNL.

About the Author: Dr. Yang earned his Ph.D. of Materials Science and Engineering from the University of Connecticut and thereafter spent nearly two years as a postdoctoral researcher at the Carnegie Mellon University. He joined PNNL as a Senior Research Scientist in Jan, 2001 and promoted to the rank of Chief Research Scientist in 2006. Dr. Yang has published more than 120 archival research papers, including about 80 journal papers, an editor or author of 14 book chapters, conference proceedings or special issues of journals, and an inventor of eight US patents. He is currently chairing the TMS Energy Conversion and Storage Committee and is Vice Chair of the ASM International and TMS Environmental Committee. Through his research for the US Department of Energy at the Pacific Northwest National Laboratory (PNNL), Dr. Yang conducts fundamental and applied research into materials for energy storage and conversion applications. He has been a technical lead in the DOE funded Solid State Electrochemical Conversion program, directs PNNL laboratory directed research and development on transformation materials for advanced electrical energy storage applications. Under this initiative, Dr. Yang and his team are investigating and developing novel materials and structures such as nanoarchitectures that can lead revolutionary electrochemical performance of Li-ion batteries and other electrochemical devices for both transportation and stationary applications. Further, his work involves developing a fundamental understanding of the roles of nanostructured electrochemically active materials in energy storage devices.

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