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PRESENTED BY THE WATERLOO INSTITUTE
FOR SUSTAINABLE ENERGY

Thursday, May 23, 2012

2 - 3 pm

DC 1302

PEM FUEL CELL CATALYSIS AND SUPERCAPACITORS AT NATIONAL RESEARCH COUNCIL OF CANADA

Dr. Jiujun Zhang, Principle Research Officer,
National Research Council Canada, Vancouver, BC

The current status of globe fossil energy and renewable energy will be reviewed in terms of their reserves, exhaustion rates, and future usage strategies. Among sustainable energy storage and conversion technologies, electrochemical technologies are believed to be the most feasible and effective. PEM fuel cells, supercapacitors, and their coupling are believed to be the long-term sustainable option for automobile applications.

Regarding PEM fuel cells, both high cost and insufficient durability are the two major barriers hindering their commercialization.

Developing cost-effective and durable catalysts has been identified as the number one priority of PEM fuel cell research and development. For supercapacitors, the insufficient energy density is the major barrier for their application.

In this presentation, the challenges and perspectives of fuel cell catalysis, the catalyst synthesis and characterization, and supercapacitor materials are reviewed and some research directions in this area are suggested in terms of making breakthroughs towards their commercialization.

Biography



Dr. Jiujun Zhang is a Principal Research Officer and Fuel Cell Catalysis Core Competency Leader at the National Research Council of Canada Institute for Fuel Cell Innovation, now Energy, Mining & Environment Portfolio (NRC-EME). He received his B.S. (1982) and M.Sc. (1985) in Electrochemistry from Peking University and his Ph.D. (1988) in Electrochemistry from Wuhan University. He took a position as an associate professor at the Huazhong Normal University for two years. In 1990, he carried out three terms of postdoctoral research at CalTech, York University and UBC. Dr. Zhang has 30+ years R&D experience in theoretical and applied electrochemistry, including 15+ years of fuel cell R&D (6 years at Ballard Power Systems and 9 years at NRC-IFCI), and 3 years of electrochemical sensor experience. Dr. Zhang holds several adjunct professorships, including uWaterloo, UBC and Peking University. He has co-authored 300 publications including 200+ refereed journal papers with approx. 6200 citations, 11 edited/co-authored books, 11 conference proceeding papers, 12 book chapters, and 50 conference and invited oral presentations. He also holds over 10 US/EU/WO/JP/CA patents, 9 US patent publications and produced 80+ industrial technical reports. He serves as the editor/editorial board member for several international journals as well as Chief-in-Editor for book series (Electrochemical Energy Storage and Conversion, CRC press). Dr. Zhang is an active member of The Electrochemical Society, the International Society of Electrochemistry, and the American Chemical Society.