

2007-2008

Materials Council Seminar Series

Georgia Institute of Technology

Moe A. Khaleel

Pacific Northwest National Laboratory

“Solid Oxide Fuel Cells: Recent Modeling and Simulation Developments”

Tuesday, October 30, 2007

Verco Classroom 299 – LOVE Bldg.

3:00-4:00PM

ABSTRACT

A key feature of the Solid Energy Conversion Alliance (SECA) core technology program (CTP) is the development of modeling and simulation tools that are applicable to a wide range of Solid Oxide Fuel Cell (SOFC) designs. This presentation summarizes state-of-the-art in SOFC and describes recent development activities conducted at Pacific Northwest National Laboratory in support of SECA CTP. The presentation focuses on the development of new analytical and computational techniques for modeling of steady state operations, microstructural electrochemistry, life prediction, and system thermal and electric modeling.

BIOGRAPHY

Dr. Khaleel is the Director of the Computational Sciences and Mathematics Division (CSMD) at the Pacific Northwest National Laboratory (PNNL). CSMD is home for PNNL's capabilities in high performance computing, computational physical and biological sciences, scientific computing environments, informatics analytics, applied mathematics, and statistical and quantitative Sciences. Dr. Khaleel was responsible for directing Pacific Northwest National Laboratory's (PNNL) hydrogen, transportation and industrial programs. He managed the advanced manufacturing product line from 1999 to 2002. In May 2001, he was promoted to the highest level of scientific accomplishment at PNNL, Laboratory Fellow. He also established and was the first technical manager for the computational mechanics and material behavior group at PNNL. From 1997 to 2001, Dr. Khaleel led the PNNL Design and Manufacturing Technical Network. He is actively involved in both basic and applied research that deals with the development of new methods for performing advanced manufacturing and computational material science and the solution of many difficult engineering problems. He currently leads interdisciplinary technical programs dealing with alloy design, and fuel cells. Dr. Khaleel is the national coordinator of the modeling activities associated with solid oxide fuel cells which is the core for the Solid Energy Conversion Alliance (SECA) funded by the Department of Energy.

Dr. Khaleel is a member of the Industrial Advisory Board of Edison Welding Institute and is a member of the Advisory Board of the School of Mechanical and Materials Engineering at Washington State University. He is a certified Mechanical Engineer in the State of Washington. He is a Fellow of the American Society of Mechanical Engineers and is an associate editor for the ASME Journal of Engineering Materials and Technology. He is also a member of the technical committees on: Constitutive Relations, the Applied Mechanics Division, the American Society of Mechanical Engineers, Stochastic Fatigue, the International Association of Structural Safety and Reliability; Fatigue and Fracture Reliability, and The American Society of Civil Engineers. Dr. Khaleel chaired and organized symposiums and technical sessions in several international conferences. He published over 100 technical articles, and won the Federal Laboratory Consortium for Superplastic Forming (2000) and the Robert J. McGrattan Literature award from the American Society of Mechanical Engineers(1999).

Host: Prof. Hamid Garmestani, 4-4495; hamid.garmestani@mse.gatech.edu

Sponsored by the School of Materials Science and Engineering
and The Materials Council

