
Editorial

Advanced fuel cell power generation systems are of significant technical and commercial interest worldwide as they offer an efficient and clean method of utilizing existing fossil and hydrocarbon fuel reserves, reduce or eliminate greenhouse gas emissions, and provide a pathway for the implementation of hydrogen fuel infrastructure and economy. Simultaneous R&D, systems engineering, prototype fabrication and product development, and demonstration for stationary, mobile, and portable applications continue at an ever increasing pace in North America, Europe, and Asia. Technical progress and breakthroughs in the areas of multifunctional metallic, ceramic, and polymeric materials, electrocatalysis, and novel processing techniques, ranging from nano materials to thin and thick film processes, remain highlights of technical meetings and publications.



Prabhakar Singh

This issue of the *Journal of Materials Engineering and Performance* highlights recent progress in the field of fuel cell science and technology with selected papers presented at the “Fuel Cells and Energy Storage Systems: Materials, Processing, Manufacturing and Power Management Technologies” meeting held at the ASM Materials Solutions Conference & Show held October 18-21, 2004, in Columbus, OH. Technical sessions at the meeting focused on recent development in PEM, MCFC and SOFCs in technical areas related to the field of metallic and ceramic materials for the fabrication of fuel cell components and balance of plant, novel gas clean up techniques and sorbents, innovative sealing materials and concepts. Challenges related to long term performance stability, cost reduction, and cell and stack design optimization were widely discussed among participants.

Multidisciplinary technology development and deployment of fuel cell products for land-based power plants, automotive auxiliary power units, and portable communication systems is actively supported by industries and government agencies. U.S. Department of Energy, through initiatives such as solid state energy conversion alliance (SECA), FreedomCAR, and Future Gen, supports the development and demonstration of highly efficient and environmentally friendly fuel cell technologies for the utilization of coal and implementation of hydrogen economy.

Guest Editor

Prabhakar Singh, PhD

Fellow, ASM International
Pacific Northwest National Laboratory
Richland, WA 99352