Symposium 2:
Solid Oxide Fuel Cells and Hydrogen Technologies

Worldwide interest in solid oxide fuel cells (SOFCs), as a promising future electricity-generation technology, has remarkably increased in recent years due to their high electrical efficiency and multi-fuel capability (hydrogen, carbon monoxide, methane, etc.). Recent developments in engineered electrode architectures, component materials chemistry, cell and stack designs, and fabrication processes have led to significant improvements in the electrical performance and performance stability as well as reduction in the operating temperature of such cells. Although their development still faces various problems with high-temperature materials, design of cost-effective materials and manufacturing processes, SOFCs are expected to enter the commercial markets in the near future.
Hydrogen economy as an emerging energy alternative relies on development of novel materials to realize the promise and expectation for a cleaner environment. Material needs and technologies in the areas of hydrogen production, storage, delivery and safety will be addressed in conjunction with hydrogen-based alternative energy sources. Papers are solicited on all aspects of SOFCs and hydrogen energy.

<PROPOSED SESSION TOPICS>
•Oxygen ion, proton and mixed conductors; conduction mechanisms, materials limitations
•Electrode materials and microstructural engineering; ceramic and metallic interconnects; degradation mechanisms
•Sealing materials, compatibility and designs
•Reliability and degradation, stability of cells and stacks
•Electrochemical performance, modeling, cell and stack designs
•Utilization of various fuels with or without reformation
•Materials and technologies for hydrogen production, storage, transportation and safety
•Prototype SOFC systems, commercialization plans, field test experience and cost

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<INVITED LECTURES>
Tentative invited lecture information is posted in the following URL;
http://www.ceramic.or.jp/pacrim13/list_of_invited_speakers.html#2

<Cooperation>
Fuel Cell Development Information Center, National Institute of Advanced Industrial Science and Technology (AIST)

Intensive Session in Symposium 2:

Proton conducting ceramics and applications

Special intensive session in Symposium 2 focuses on proton conducting ceramics and the applications, including the ionics, novel materials, electrodes, modeling, characterization and also the cells, stacks, systems based on proton conducting materials. The session also focuses fabrication technologies of materials, cells, devices, and interface phenomena, mechanical properties.

<PROPOSED SESSION TOPICS>
•Ionics of proton conducting oxides
•Novel proton conductors
•Electrode for proton conducting devices

•Numerical modeling for proton conductors
•Fuel cell/electrolysis cells, stacks, systems
•Novel characterization technologies for proton conducting phenomena
•Novel applications using proton conductors

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