



第254回触媒化学研究センター談話会

演 題 : FUEL CELLS: IMPORTANCE, STATUS AND RESEARCH NEEDS

講演者 : Dr. Mark C. Williams Visiting Professor

Fellow of the ECS
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日 時 : 2009年4月13日(月)

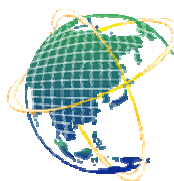
15:00 - 16:00

会 場 : 北海道大学創成科学研究棟4階 セミナー室A

要 旨 : Fuel cells are being developed for a variety of markets. Fuel cells make many energy systems perform and look better - hydrogen automobiles, future coal-based gasification plants, and biomass. They are the highest efficiency conversion devices from chemical to electrical energy. Fuel cell maximum thermal efficiency on hydrogen-oxygen exceeds Carnot thermal efficiency below 1200K (1 bar) and 1400K (30 bar). Direct conversion of available fuels to electrical energy is possible for a variety of fuels with fuel cells. The direct conversion efficiencies possible are the highest obtainable. Both ammonia and methanol, new opportunity fuels for the future, have higher thermal efficiencies than hydrogen. The highest efficiency systems for converting chemical to electrical energy are fuel cell turbine hybrids. The maximum possible simple fuel cell hybrid system thermal efficiency (gas phase) is 0.945 (LHV). SOFC thermal efficiencies will improve as temperature is lowered. SOFCs are closer to meeting their maximum thermal efficiency on conventional fuels such as methane. Hybrids, PEFC, intermediate temperature SOFC, DCFC and direct methane oxidation are important areas for fuel cell research. Each area has a status and research needs to progress further.

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**Catalysis &
Materials Science**

Hokkaido University GCDE Program, 2007-2011