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Preface

Catalysis in ultra-clean fuels production☆

This special issue is based on the symposium ''Ultra-Clean Transportation Fuels'', 228th American Chemical Society (ACS) National Meeting, August 22–26, 2004, Philadelphia, USA, sponsored by ACS Fuel Chemistry Division, co-sponsored by ACS Petroleum Chemistry Division. We three were happy to organize this 4-half-day symposium where 31 oral presentations from a lot of countries were included. Fourteen selected papers from the symposium contributors appear in this special issue.

Aiming at sustainable development of the globe, ultra-clean fuels production is a very hot and important area from the viewpoint of chemistry, energy, environmental protection and is a main application field of catalysis as well as green chemistry. This symposium covered almost all aspects of ultra-clean fuels production where catalysts are employed. From desulfurization, denitrogenation, demetallization and dearomatization to general hydrotreating, upgrading of heavy oil or oil sand, from syngas production to Fischer–Tropsch synthesis, methanol synthesis and other gas-to-liquid (GTL)-related technologies, from biomass utilization to dimethyl ether (DME) production, from hydrogen production, storage to fuel-cell related catalysis reaction, various fields of ultra-clean fuels were included, and different catalysis system as well as catalytic engineering processes were discussed. Especially many contributions from industry in this symposium disclosed up-to-date catalytic achievement in ultra-clean fuels production. We believe that this special issue can provide a condensed content of the symposium.

Catalyst plays a key role in energy process as what behaves in chemical plants. New findings and development of catalysis and catalyst can provide new methodology to energy industry, explore new products and new process in fuels production and other energy-related areas, such as fuel cell and hydrogen utilization technology.

Recently, technology of removal of sulfur or other hetero atoms becomes very important due to fuel cell application as well as automobile exhaust gas purification. Similarly, gas to liquid (GTL) technology or C1 chemistry, a more popular name in Japan and Asia, is a new business area as it can provide various hydrocarbons, alcohols, ethers without sulfur or aromatics, even extended to energy resources other than natural gas, such as biomass, coal, heavy oil, garbage including waste plastics. Of course all these fields are closely related to fuel cell technology, practice of vehicle engine and performance of exhaust gas purification system.

It is expected that readers can get the latest information of the present energy research and industry, based on sustainable development of catalysis science itself.

At last, endeavor of Professor M. Misono which realized the publication of this special issue is greatly appreciated.

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