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Preface

Recent advances in catalytic production of hydrogen from renewable sources

This special issue of Catalysis Today is devoted to the catalytic aspects of hydrogen (H_2) production from renewable sources such as biomass and biomass-derived oxygenates including methanol, ethanol and glycerol, as well as the photocatalytic decomposition of water.

H_2 has recently been under investigation as an environmentally clean fuel for future energy systems. It is currently produced mainly from natural gas and consumed as a chemical feedstock for the synthesis of ammonia, methanol, oil refining and fine chemicals synthesis, etc. Its demand is expected to increase in the future when H_2 powered fuel cells are introduced in the market. As chemical feedstock, its consumption in refineries is increasing for the production of ultra-low sulfur gasoline and diesel to meet stringent environmental regulations.

This special issue is based on papers presented at the ''International Symposium on Hydrogen from Renewable Sources and Refinery Applications'' as a part of the American Chemical Society (ACS) national meeting held in Atlanta, Georgia, USA from March 28–30, 2006. The symposium featured 53 presentations, including 11 keynote speeches by experts in this field from industry, academia and national laboratories in the U.S. and around the world. The papers presented in this symposium covered five major topics as follows:

(1) Hydrogen production from biomass,
(2) hydrogen production from petroleum refinery off-gas,
(3) hydrogen production from water,
(4) hydrogen production for clean transportation and
(5) topics related to hydrogen production.

The symposium attracted a large number of attendees on all 3 days and active discussions were held during the presentations.

This special issue consists of 22 papers, including 3 papers on H_2 production by biomass pyrolysis and gasification in supercritical water, 10 papers on the reforming of methanol, ethanol and glycerol and 4 papers on the photocatalytic production of hydrogen from water, all selected on the basis of a standard peer-review process. The contributions also include papers on H_2 production from lubricating oils and the catalytic partial oxidation of natural gas under short contact time. Papers on membrane purification, and water and thermal balances for a liquid-fueled fuel processor have also been incorporated in this issue. Although the later topics are usually not covered in catalysis journals, the concepts and materials employed are closely related to catalysis and the technology discussed are crucial for the development of a hydrogen economy. We hope that the research community working on H_2 energy will find this special issue a good collection of interesting articles.

This special issue has been made possible by all the authors and a large number of reviewers. We wish to thank each one of them for their strong support and timely contributions. We wish to acknowledge the ACS Division of Petroleum Chemistry for sponsoring this symposium as a part of the ACS National Meeting. We are also grateful to the journal editors, Prof. J.J. Spivey and Prof. J.R.H. Ross for giving us the wonderful opportunity to publish this special issue, and to the editorial team at Elsevier for their support.

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