Biomass Bioprocessing

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Published online: 10 November 2011
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Keywords American Institute of Chemical Engineers, AIChE · Center for Energy Initiatives, CEI · International Congress on Energy, ICE · Biomass Bioprocessing · Bioenergy

This issue of *BioEnergy Research* titled “Biomass Bioprocessing” is the first of a series of special issues to feature work presented at the International Congress on Energy (ICE), a topical conference within the American Institute of Chemical Engineers (AIChE) Annual Meetings. The ICE is sponsored by the Center for Energy Initiatives (CEI), an AIChE technological community, and a primary forum for chemical engineers and industry experts to discuss, learn about and impact energy issues, and review best practices for ensuring a clean, sustainable and affordable energy supply for the future.

The 1st ICE was held in conjunction with the 2010 AIChE Annual Meeting in Salt Lake City, November 7–12, 2010. The theme of the ICE was “Sustaining Supplies” and focused on recent developments that are instrumental to a better understanding of the technologies, and the research and development that will stimulate innovative thinking to advance energy supply efforts. The conference addressed critical issues across three key areas: Bioenergy; Fossil Fuels with Carbon Capture and Sequestration; and Alterna-

tive Energy and Enabling Technologies. The 1st ICE featured over 160 sessions related to technology, markets, business strategies and policy covering the solar, nuclear, lignocellulosics, biorefineries, and green innovation energy sectors.

The first special issue of this series contains nine papers, including two reviews and seven original research papers, authored by distinguished scientists and researchers from USA, Canada, Japan, Austria, and China. Special topics that have been addressed in this issue under the umbrella of “Biomass Bioprocessing” include: bioconversion and bioproducts from lignocellulosic biomass; enzymatic hydrolysis of transgenic plants; production of biofuels such as bioethanol and biodiesel; thermochemical conversion of biomass to bio-oil and bio-char, including economic analysis; applications of bio-char for carbon sequestration and soil amendment; social and economic modeling in energy crop production. The focus of the first review article is on impact of pretreatment methods (acid, steam, ammonia, lime, fungi, ethanol, ionic liquids, etc) and enzymatic hydrolysis of lignocellulosic biomass (using cellulases, xylanases, pectinases, etc., and enzyme cocktails) on ethanol production. The second review provides a critical evaluation of the potential of biomass lignin and hemicellulose for production of value-added biochemicals and bioproducts such as lignosulfonates, phenolic compounds, antioxidants, resins, furfural, xylose, xylitol, lactic acid, etc. Altogether, the articles presented in the special issue have captured the diversity and complexity of on-going research in the broad field of “Biomass Bioprocessing” for sustainable production of bioenergy and bioproducts, a challenge and an opportunity that we currently face in our endeavors to transition to a bio-based economy and society.

I would like to sincerely thank the guest editors, the anonymous reviewers, and the editorial staff at Springer

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who all worked efficiently and diligently under tight deadlines to ensure that high-quality manuscripts conforming to the high standards of *BioEnergy Research* have been delivered for this special issue. The valuable contributions of the following guest editors are hereby highly recognized:

Dr. Akwasi Boateng, USDA-ARS, Eastern Regional Research Center, Wyndmoor, PA

Dr. Lew Christopher, South Dakota School of Mines & Technology, Rapid City, SD

Dr. Manuel Garcia-Perez, Washington State University, Pullman, WA

Dr. William Gibbons, South Dakota State University, Brookings, SD

Dr. Jim Kiniry, USDA-ARS, Grassland Soil and Water Research Laboratory, Temple, TX

Dr. Kurt Spokas, USDA-ARS, St. Paul, MN

Dr. Kyoung Ro, USDA-ARS, Coastal Plains Soil, Water, and Plant Research Center, Florence, SC

Dr. JunYong Zhu, USDA Forest Service, U.S. Forest Products Laboratory, Madison, WI

I would also like to acknowledge the AIChE Center for Energy Initiatives, and in particular Dr. Darlene Schuster, Executive Director of the Institute for Sustainability at AIChE, and Dr. Thomas Bond, Chair of the 1st International Congress on Energy, for their cooperation and assistance in the selection of manuscripts, and for providing the cover image for the special issue.