

# Innovative Solutions in Fluid-Particle Systems and Renewable Energy Management

Part of the Research Essential Book Series

Katia Tannous (University of Campinas, Brazil)

## Description:

The threat of natural resource depletion due to high energy demands has become a key concern in both the developed and developing worlds. To alleviate these concerns, researchers around the world are exploring sustainable methods for generating energy.

**Innovative Solutions in Fluid-Particle Systems and Renewable Energy Management** presents phenomenological, experimental, and theoretical research, as well as market criteria and business models concerning the development of small- and large-scale chemical and energy plants. Associating academic and industrial experiences, this book highlights current topics in sustainable energy management and development with an emphasis on obtaining liquid, gaseous, and solid fuels using residues and energetic biomasses.

A pivotal publication in the field of engineering, this title covers a range of topics including, among others, cellulosic feedstock, agricultural biomass, fluid dynamics, gasification processes, energy extraction from raw materials, and environmental sustainability.

## Readers:

Academicians, researchers, and technology developers will find this book useful in furthering their own knowledge and research in this field.

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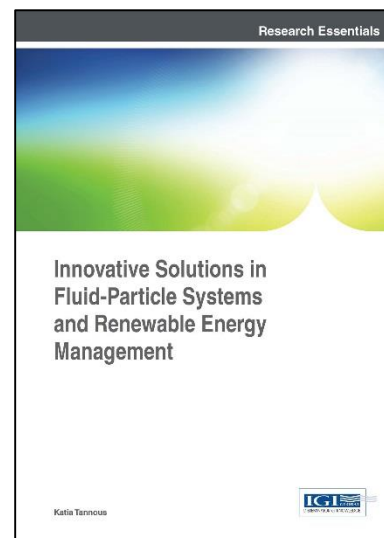
Pages: 316

## Topics Covered:

- Chemical Reactors
- Characterization of Solid Particles
- Energy and Mass Balance
- Fluidized Beds
- Heat Transfer
- Mass Transfer
- Particle Size Reduction
- Storage of Powders
- Transport of Solids

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## Chapter 1.

*Modeling Size Reduction and Fractionation for Cellulosic Feedstock*

Ladan J. Naimi, University of British Columbia, Canada  
Shahab Sokhansanj  
University of British Columbia, Canada & Oak Ridge National Laboratory, USA  
Xiaotao Bi, University of British Columbia, Canada  
Choon. Jim Lim, University of British Columbia, Canada  
Antony Lau, University of British Columbia, Canada  
Mohammad Emami, University of British Columbia, Canada  
Staffan Olof Mellin, University of British Columbia, Canada

## Chapter 2.

*Effect of Steam Explosion Pretreatment on Size Reduction and Pellet Quality of Woody and Agricultural Biomass*

Pak Sui Lam, University of British Columbia, Canada  
Pak Yiu Lam, University of British Columbia, Canada  
Shahab Sokhansanj, University of British Columbia, Canada & Oak Ridge National Laboratory, USA  
Xiaotao Bi, University of British Columbia, Canada  
Choon Jim Lim, University of British Columbia, Canada  
Staffan Melin, University of British Columbia, Canada

## Chapter 3.

*Fluid Dynamic and Mixing Characteristics of Biomass Particles in Fluidized Beds*

Katia Tannous, University of Campinas, Brazil  
Joana Bratz Lourenço, University of Passo Fundo, Brazil

## Chapter 4.

*Modeling the Kinetics of Lignocellulosic Biomass Pyrolysis*

Yesid Javier Rueda-Ordóñez, University of Campinas, Brazil  
Érico de Godois Baroni, University of Campinas, Brazil  
Lizeth Katherine Tinoco-Navarro, University of Campinas, Brazil  
Katia Tannous, University of Campinas, Brazil

## Chapter 5.

*Microwave heating Assisted Biorefinery of Biomass*

Sherif Farag, École Polytechnique de Montréal, Canada  
Jamal Chaouki, École Polytechnique de Montréal, Canada

## Chapter 6.

*Liquid Products Characterization from Pyrolysis and Gasification: How Can it Be Classified?*

Caio Glauco Sánchez, University of Campinas, Brazil  
Renata Aparecida Figueiredo, Federal University of Pernambuco, Brazil  
Flávio Augusto Bueno Figueiredo, Federal University of Pernambuco, Brazil  
Elisabete Maria Saraiva Sanchez, University of Campinas, Brazil & Salesiano University Center of São Paulo, Brazil  
Jesús Arauzo, University of Zaragoza, Spain  
Alberto Gonzalo Callejo, University of Zaragoza, Spain  
Rolando Zanzi Vigouroux, Royal Institute of Technology, Sweden

## Chapter 7.

*Energy and Exergy Analysis on Gasification Processes*

Edgardo Olivares Gómez, Brazilian Center for Research in Energy and Materials, Brazil  
Renato Cruz Neves, Brazilian Center for Research in Energy and Materials, Brazil  
Elisa Magalhães de Medeiros, University of Campinas, Brazil  
Mylene Cristina Alves Ferreira Rezende,  
Brazilian Center for Research in Energy and Materials, Brazil

## Chapter 8.

*Biomass Processing Routes for Production of Raw Materials with High added Value: Prospects and Challenges for the Developing Routes*

Rubens Maciel Filho, University of Campinas, Brazil  
Laura Plazas Tovar, University of Campinas, Brazil  
Yurany Camacho Ardila, University of Campinas, Brazil  
Jaiver Efrén Jaimes Figueroa, University of Campinas, Brazil  
Maria Regina Wolf Maciel, University of Campinas, Brazil

## Chapter 9.

*Technical and Marketing Criteria for the Development of Fast Pyrolysis Technologies*

Juan Miguel Mesa Pérez, Bioware Technology  
Felix Fonseca Feltri, Methodist University of Piracicaba

## Chapter 10.

*Sustainability, Business Models, and Techno-economic Analysis of Biomass Pyrolysis Technologies*

Manuel Garcia-Perez, Washington State University, USA  
Jesus Alberto Garcia-Nunez,  
Washington State University, USA & Colombian Oil Palm Research Centre, Colombia  
Manuel Raul Pelaez-Samaniego,  
Washington State University & Universidad de Cuenca, Ecuador  
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