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Nota di contenuto

Front Cover; Biomass Gasification, Pyrolysis, and Torrefaction; Copyright Page; Dedication; Contents; Preface; Acknowledgments; About the Author; 1 Introduction; 1.1 Biomass and its Products; 1.1.1 Products of Biomass; 1.1.1.1 Chemicals Industries; 1.1.1.2 Energy Industries; 1.1.1.3 Transport Industries; 1.1.1.4 Environmental Industries; 1.2 Biomass Conversion; 1.2.1 Biochemical Conversion; 1.2.2 Thermo chemical Conversion; 1.2.2.1 Combustion; 1.2.2.2 Pyrolysis; 1.2.2.3 Torrefaction; 1.2.2.4 Gasification; 1.2.2.5 Liquefaction; 1.3 Motivation for Biomass Conversion; 1.3.1 Renewability Benefits
1.3.2 Environmental Benefits 1.3.2.1 Carbon-Neutral Feature of Biomass; 1.3.2.2 Sulfur Removal; 1.3.2.3 Nitrogen Removal; 1.3.2.4 Dust and Hazardous Gases; 1.3.3 Sociopolitical Benefits; 1.4 Historical Background; 1.5 Commercial Attraction of Gasification; 1.5.1 Comparison of Gasification and Combustion; 1.6 Brief Description of Some Biomass Conversion Processes; 1.6.1 Torrefaction; 1.6.2 Pyrolysis; 1.6.3 Combustion of Carbon; 1.6.4 Gasification of Carbon; 1.6.5 Syngas Production; 1.6.6 Methanol Synthesis; 1.6.7 Ammonia Synthesis; 1.6.8 Fischer-Tropsch Reaction; 1.6.9 Methanation Reaction Symbols and Nomenclature 2 Economic Issues of Biomass Energy Conversion; 2.1 Introduction; 2.2 Biomass Availability and Products; 2.2.1 Availability Assessment; 2.2.1.1 Energy Crop; 2.2.1.2 Biomass Cost; 2.2.2 Product Revenue from Biomass Conversion; 2.2.2.1 Energy Revenue; 2.2.2.2 Revenue from Chemicals; 2.2.2.3 Revenue from Secondary Fuel Production; 2.3 Biomass Conversion Process Plant Equipment and Cost; 2.3.1 Biomass Collection System; 2.3.2 Preprocessing; 2.3.3 Gasifier Cost; 2.3.4 Torrefier Cost; 2.3.5 Pyrolyzer Cost; 2.3.6 Comparison of Capital Costs; 2.4 Financial Analysis
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3.6.2.2 Ash

Sommario/riassunto

Biomass is the most widely used non-fossil fuel in the world. Biomass resources show a considerable potential in the long-term given the increasing proliferation of dedicated energy crops for biofuels. The second edition of Biomass Gasification and Pyrolysis is enhanced with new topics, such as torrefaction and cofiring, making it a versatile resource that not only explains the basic principles of energy conversion systems, but also provides valuable insight into the design of biomass conversion systems. This book will allow professionals, such as engineers, scientists, and op