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production from lignocellulosic biomass / Agrimi, Gennaro / Pisano, Isabella / Palmieri, Luigi -- 10 Catalytic conversion of biosourced raw materials: homogeneous catalysis / Fischmeister, Cédric / Bruneau, Christian / De Oliveira Vigier, Karine / Jérôme, François -- 11 Catalytic conversion of oils extracted from seeds: from polyunsaturated long chains to functional molecules / Garrier, Eva / Packet, Dirk -- 12 Heterogeneous catalysis applied to the conversion of biogenic substances, platform molecules, and oils / Dibenedetto, Angela / Colucci, Antonella / Pastore, Carlo -- 13 Biomass gasification: gas production and cleaning for diverse applications - CHP and chemical syntheses / Panopoulos, Kyriakos D. / Christodoulou, Christos / Koytsoumpa, Efthymia-Ioanna -- 14 From Syngas to fuels and chemicals: chemical and biotechnological routes / Ricci, Marco / Perego, Carlo -- 15 Conversion of biomass to fuels and chemicals via thermochemical processes / Lappas, Angelos A. / Iliopoulou, Eleni F. / Kalogiannis, Konstantinos / Stefanidis, Stylianos -- 16 Cellulosic ethanol production in northern Sweden - a case study of economic performance and GHG emissions / Slade, Raphael -- 17 Anaerobic fermentation: biogas from waste - the basic science / Aresta, Michele -- 18 From lab-scale to full-scale biogas plants / Farina, Roberto / Spagni, Alessandro -- Index

Sommario/riassunto

This book provides an introduction to the basic science and technologies for the conversion of biomass (terrestrial and aquatic) into chemicals and fuels, as well as an overview of innovations in the field. The entire value chain for converting raw materials into platform molecules and their transformation into final products are presented in detail. Both cellulosic and oleaginous biomass are considered. The book contains contributions by both academic scientists and industrial technologists so that each topic combines state-of-the-art scientific knowledge with innovative technologies relevant to chemical industries. Selected topics include: Refinery of the future: feedstock, processes, products The terrestrial and aquatic biomass production and properties Chemical technologies and biotechnologies for the conversion of cellulose, hemicellulose, lignine, algae, residual biomass Thermal, catalytic and enzymatic conversion of biomass Production of chemicals, polymeric materials, fuels (biogas, biodiesel, bioethanol, biohydrogen) Policy aspects of biomass product chains LCA applied to the energetic, economic and environmental evaluation of the production of fuels from biomass: ethanol, biooil and biodiesel, biogas, biohydrogen