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Analysis of a Biofuel Production System; Chapter 19 Comprehensive Study of Cellulosic Ethanol Using Hybrid Eco-LCA Advanced Technology In Biofuel; Chapter 20 Biobutanol Production from Agri-Residues; Chapter 21 Application of Nanotechnology and Nanomaterials for Bioenergy and Biofuel Production

Sommario/riassunto

Sponsored by the Bioenergy and Biofuel Task Committee of the Environmental Council of the Environmental and Water Resources Institute of ASCE. This book is one of the first to provide in-depth technical information on the broad topics of biofuel and bioenergy with extensive illustrations, case studies, summary tables, and up-to-date references. Biofuel and bioenergy produced from biowastes and biomass is a clean energy source that can be produced renewably. The 21 chapters of this book offer state-of-the-art reviews, current research, and technology developments with respect to first-, second-, and third-generation biofuels and bioenergy. The book focuses on the biological/biochemical pathway, as this option has been reported to be the most cost-effective method for biofuel/bioenergy production. The opening chapter gives an overview of the current status of biofuel and bioenergy production. Subsequent chapters cover biomethane production, microbial fuel cells, feedstock production, preprocessing, biomass pretreatment, enzyme hydrolysis, and syngas fermentation. Algal processes for biofuel production, biobutanol production, bioreactor systems, and value-added processing of biofuel residues are included. This book addresses life-cycle analyses of first- and second-generation biofuels (from corn, soybean, jatropha, and cellulosic biomass) and the emerging applications of nanotechnology in biofuel/bioenergy production. Each chapter builds a foundation for the one that follows, and each chapter concludes with current research trends and further research needs. This book will be valuable to researchers, instructors, senior undergraduate and graduate students, decision-makers, professionals, and others interested in the field of biofuel/bioenergy. Praise for This Book This book attempts to provide an in-depth compilation of relevant technical information on several aspects of biofuel and bioenergy production ... it can serve as a useful quick reference for consulting engineers. It is also a good introductory resources for advanced students, researchers, instructors, decision makers, and professionals in the biofuel and bioenergy field. Recommended. —A.C. Sheth, emeritus, University of Tennessee Space Institute, Choice: Current Reviews for Academic Libraries, December 2010.