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Chapter 5 - Biomass Sources for Hydrogen Production; 5.1 INTRODUCTION; 5.2 BIOMASS COMPOSITION AND PROPERTIES; 5.3 BIOMASS RESOURCE POTENTIAL; 5.4 PRETREATMENT OF BIOMASS FEEDSTOCKS; 5.5 METHODOLOGIES FOR THE PRODUCTION OF HYDROGEN FROM BIOMASS; 5.6 LIFE CYCLE ASSESSMENT AND HYDROGEN PRODUCTION COSTS; References; Chapter 6 - Hydrogen from Biomass: Advances in Thermochemical Processes; 6.1 INTRODUCTION; 6.2 STEAM REFORMING OF BIOMASS-DERIVED CHEMICALS; 6.3 AQUEOUS-PHASE REFORMING; 6.4 SUPERCRITICAL REFORMING
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8.2 DARK FERMENTATION 8.3 PHOTOFERMENTATION; 8.4 COUPLED PROCESSES TO DARK FERMENTATION; 8.5 BIOLOGICAL WATER GAS SHIFT REACTION; 8.6 BIOPHOTOLYSIS OF WATER; 8.7 LIFE CYCLE ASSESSMENT OF THE BIOLOGICAL H2 PRODUCTION; 8.8 CONCLUSIONS; Acknowledgments; References; Chapter 9 - Advances in Structured and Microstructured Catalytic Reactors for Hydrogen Production; 9.1 INTRODUCTION; 9.2 STRUCTURED CATALYSTS; 9.3 MICROSTRUCTURED REACTORS; 9.4 SUBSTRATE MATERIALS FOR STRUCTURED CATALYSTS AND MICROSTRUCTURED REACTORS; 9.5 CATALYST COATING ON STRUCTURED SUBSTRATE; 9.6 HYDROGEN PRODUCTION FROM BIOFUELS
9.7 COMBUSTION

Sommario/riassunto

The fields covered by the hydrogen energy topic have grown rapidly, and now it has become clearly multidisciplinary. In addition to production, hydrogen purification and especially storage are key challenges that could limit the use of hydrogen fuel. In this book, the purification of hydrogen with membrane technology and its storage in ""solid"" form using new hydrides and carbon materials are addressed. Other novelties of this volume include the power conditioning of water electrolyzers, the integration in the electric grid of renewable hydrogen systems and the future role of microreactors