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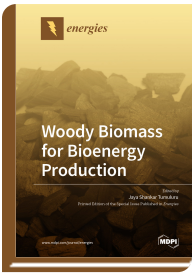
Woody Biomass for Bioenergy Production



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Woody biomass is most widely used for energy production. In the United States, roughly 2% of the energy consumed annually is generated from wood and wood-derived fuels. Woody biomass needs to be preprocessed and pretreated before it is used for energy production. Preprocessing and pretreatments improve the physical, chemical, and rheological properties, making them more suitable for feeding, handling, storage transportation, and conversion. Mechanical preprocessing technologies such as size reduction and densification, help improve particle size distribution and density. Thermal pretreatment can reduce grinding energy and torrefied ground biomass has improved sphericity, particle surface area, and particle size distribution. This book focuses on several specific topics, such as understanding how forest biomass for biofuels impacts greenhouse gas emissions; mechanical preprocessing, such as densification of forest residue biomass, to improve physical properties such as size, shape, and density; the impact of thermal pretreatment temperatures on woody biomass chemical composition, physical properties, and microstructure for thermochemical conversions such as pyrolysis and gasification; the grindability of torrefied pellets; use of wood for gasification and as a filter for tar removal; and understanding the pyrolysis kinetics of biomass using thermogravimetric analyzers.

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