

BIOMASS CONVERSION TO BIOFUELS AND BIO-BASED PRODUCTS VIA GREEN TECHNOLOGY AND PROCESSES

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In view of global attention to reduce our dependency on non-renewable resources, extensive efforts have been spurred towards sustainable development and utilization of our natural resources to mitigate the effects of rising global energy demand, due to continuous growth of world population and industrialized economy. This has motivated the utilization and transformation of biomass into useful bioenergy and biomaterials. The speech features sharing of technology and conversion processes from the perspective of sustainability, in line with global established goals and principles, such as Sustainable Development Goals (SDGs) and 12 principles of Green Chemistry. Furthermore, researches on process development and innovation of biomass conversion to various types of biofuels and bio-based products are highlighted. These include studies on liquid fuels, such as biodiesel and bio-oil, derived via esterification, pyrolysis and liquefaction processes. Studies on syngas and solid biochar production with increased calorific values through catalytic gasification and torrefaction, are also presented. Apart from that, biopesticides derived bio-active compounds extracted from plant materials using supercritical fluid extraction and synthesis of novel natural-hydro low-transition-temperature-mixture using malic acid extracted from plants by microwave hydrothermal technology for biomass delignification will be discussed. Intensification technology for biodegradable drilling fluid properties improvement using nanoparticles (graphene nanosheet, carbon nanotube and graphene oxide) are studied and compared. Research on synthesis of renewable diesel from rubber seed oil hydrotreated by novel hydrogen-rich donor solvent is also shared. The development of microporous activated carbon via simplified physical activation from various agricultural and industrial wastes and study on their performance on gas sorption is also presented.



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