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PROCESS OPTIMIZATION AND ENVIRONMENTAL ANALYSIS FOR SUSTAINABLE BIOFUELS AND BIOCHAR PRODUCTION

Chemicals from biomass: biofuels and intermediate

Scope

Growing awareness of environmental issues created the demand for the production of biofuel and biochar for efficient waste management which is the primary concern and is expected to expand its utilization. Biofuel and biochar are produced by numerous procedures and advancements ought to be developed for sustainable thermochemical (pyrolysis, torrefaction, gasification, etc.,), chemical conversions, and biochemical processes (digestion, fermentation) to achieve climate targets and carbon neutrality. Process optimization is essential for perfect execution and environmental protection which comprises screening, mitigating measures, identifying, analyzing, and implementing the most needed procedure for environmental management, accurate forecasting, decision-making, and others. Environmental analysis is necessary to gain insights into the potential impacts on natural resources, public health, safety, and the economy. It aids in earlier prediction of environmental impacts concerning biofuels and biochar production in order to optimize the planning, design, and techniques to reduce the effects to make the process suitable for the environment. Sustainable production of biofuels and biochar can lower the pollution caused by inappropriate organic disposal. Biochar has wider applications in sewage treatment, soil development, etc.,

The utilization of sustainable biofuel and biochar technologies are coming up with remarkable opportunities in the future to lessen the complexity and reach net-zero targets, and organize safe, stable, and wide-ranging application systems in the ecosystem. Sustainable biofuel production processes are closed loop systems that are energy efficient and eco-friendly. Effective conversion of residues with sustainable biorefinery for biofuel and biochar production will support decarbonization in transportation and GHG reduction by implementing tremendous applications to manage the environment having risks. Challenges of process optimization and environmental analysis explore advanced evolution for sustainable production of biofuels and biochar, that is required to be implemented for the well-being of the environment and health. The environmental sustainability of the produced biofuel and biochar was assessed through a life cycle assessment for the successful adoption of generated energy.

This special issue explores game-changing developments for creating a sustainable environment by means of process optimizations and environmental analysis for increased production of sustainable biofuel and biochar with the growing trends and advancements.

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Topics of Interest

- Process optimization and environmental effects of agriculture residues for sustainable biofuels and biochar production
- Advanced range of strategies in process optimization methods for global applications of biofuel production
- Process optimization and assessments in improved pyrolysis-based various biomass conversation for environmental management
- Process optimizations and environmental analysis for sustainable biochar production in reducing greenhouse gas emission levels
- Recent trends in biofuel-production process technologies with microbial applications
- Environmental impact analysis of drivers and controls in biochar productions for sustainability and circular bioeconomy
- Novel process optimizations method in the sustainable production of nano-biochar for multiple environmental applications
- State-of-the-art techniques in biofuels production and future challenges of renewable energy for environment management
- Life cycle approaches of biorefineries and cutting-edge design, optimization, and environmental analysis for bioenergy production
- Catalytic processes optimization in biofuel production for managing environmental degradation and performance efficiency

Important dates

- **Start date: 10 December 2023**
- **End date: 30 May 2024**

Keywords

Biofuels, Biochar, Biorefineries, Renewable Energy, Sustainable Environment

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