

Sustainable Environmental Waste Management Strategies

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Bioenergy and Value Added Byproducts from Biomass Waste

 Springer

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Chapter 7

Green Synthesized Nanomaterials and Its Role in the Biofuel Production



Ayush Saxena, Akhtar Hussain, Fouziya Parveen, Nafisa Shaheen,
Zeeshan Quraishi, Mariyam and Mohammad Ashfaque

Abstract The continuously increasing demand for fossil fuels leads to a negative impact on the environment causing the increase in greenhouse gases and depletion of the ozone layer. To solve this problem, various countries are developing green fuels. Green fuels or biofuels are characterized into four generations depending upon the source used for their production. Developing biofuels such as bioethanol, biodiesel, biogas, etc. requires multiple steps. These steps are based on different techniques, and out of all steps some steps require high energy and chemicals for the production of desired products which ultimately cause negative impacts on the environment as well as on the yield of the product. To combat this major hurdle concerning biofuel production researchers around the globe nowadays involve the use of green nanotechnology in their work. Green nanotechnology mainly involves bioactive agents such as plant extracts, lignocellulose wastes, microbes, and other biowastes for synthesizing green nanomaterials that leverage the sustainable development of various biofuels. The application of green nanomaterials is vast due to their, nanoscale size, surface area, stability, catalytic efficiency, no toxicity, low environmental footprints, and reduced energy consumption. This chapter showcases the type, versatility, applications, and challenges of green nanomaterials used in biofuel production.

Keywords Green nanotechnology · Biofuels · Renewable energy · Nanocatalyst · Zero waste

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