

A review of bioethanol production from plant-based waste biomass by yeast fermentation

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Abstrak

Commercialization of

bioethanol has recently intensified due to its market stability, low cost, sustainability, alternative fuel energy composition, greener output and colossal fossil fuel depletion. Recently, because of greenhouse intensity worldwide, many researches are ongoing to reprocess the waste as well as turning down the environmental pollution. With this scenario, the invention of bioethanol was hailed as a great accomplishment to transform waste biomass to fuel energy and in turn reduce the massive usages of fossil fuels. In this study, our review enlightens various sources of plant-based waste feed stocks as the raw materials for bioethanol production because they do not adversely impact the human food chain. However, the cheapest and conventional fermentation method, yeast fermentation is also emphasized here notably for waste biomass-to-bioethanol conversion. Since the key fermenting agent, yeast is readily available in local and international markets, it is more cost-effective in comparison with other fermentation agents. Furthermore, yeast has genuine natural fermentation capability biologically and it produces zero chemical waste. This review also concerns a detailed overview of the biological conversion processes of lignocellulosic waste biomass-to-bioethanol, the diverse performance of different types of yeasts and yeast strains, plus bioreactor design, growth kinetics of yeast fermentation, environmental issues, integrated usages on modern engines and motor vehicles, as well as future process development planning with some novel co-products.