

Bioethanol production from sugarcane residues

Deekshita Khandelwal

Renewable and environmentally sustainable fuel resources such as bioethanol are the need of the moment due to the decline and adverse effects of sources such as fossil fuels. The burning of fossil fuels causes a large amount of carbon dioxide emission which contributes to the greenhouse effect, leading to global warming and climate change. Hence, bioethanol production from organic waste is a potentially sustainable bioenergy source. However, bioethanol produced from food substrates, such as grains, molasses, etc. is not suitable for the long term because the global demand for food continues to grow along with the need for renewable biofuels. Therefore, sugarcane residues, such as bagasse and straws could be an ideal feedstock for bioethanol production. These organic wastes are rich in carbohydrates and are the largest cellulosic agro-industrial byproducts, hence they do not compete with the food demands. The biological process of converting the sugarcane bagasse into bioethanol involves the following steps: (a) pretreatment of sugarcane bagasse, (b) conversion of bagasse into fermentable sugars, (c) fermentation of sugarcane bagasse using yeast, and (d) distillation process and determination of bioethanol yield. Ethanol produced from sugarcane residues is one of the most sustainable alternatives to ethanol produced from maize, grains and other food substrates. Hence, further studies need to be carried out to optimise this potential long-term energy source and meet the rising fuel needs of society.

Keywords: Sugarcane bagasse, Bioethanol production, Fermentation, Renewable energy, Sustainable

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