

Microbial biotechnology for sustainable development

Wednesday, May 11, 2022 5:40 PM (20 minutes)

Microorganisms are tiny cell factories that produce several metabolite, many of these are useful to mankind. Microbes can be efficiently utilized for the synthesis of fuels and high value chemicals. Most of the chemical reactions, which are harmful to the environment, can be replaced by environmentally friendly biological routes through the use of microbes. Environmental sustainability is the one of the major advantage of microbial based process where the reactions are carried out under mild condition without any use of harsh conditions and toxic catalysts. The use of agricultural and other industrial organic wastes can be utilized in the process which makes the process more sustainable and environmentally friendly. The bioconversion of low value agro-residues into a high value chemical would be an economical strategy in terms of waste disposal for biorefineries. The present study describes the use of microbes for the production of industrially important building block chemical, 1,3-propanediol. In this study *Lactobacillus brevis* was used to produce 1,3-propanediol in batch fermentations. Different carbon sources like pure hexose and pentose sugars, mixed pentose sugar containing acid pretreated liquor (APL) from rice straw and different concentrations of pentose sugars and acid pretreated liquor were evaluated for the production of 1,3-propanediol. The upstream and downstream process for the production of 1,3-propanediol have been optimized.

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Session Classification: Geology/Biology - Parallel

Track Classification: Geology