

Fermentation of Wood Waste by Treating with H₃PO₄-Acetone for Bioethanol Production

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Abstract : Wood waste is a potentially significant resource for economic and environment-friendly recycling. Wood waste represents a key sustainable source of biomass for transformation into bioethanol. Unfortunately, wood waste is highly recalcitrant for biotransformation, which limits its use and prevents economically viable conversion into bioethanol. As a result, an effective pretreatment is necessary to degrade cellulose of the wood waste, which improves the accessibility of cellulase. In this work, a H₃PO₄-acetone pretreatment was selected among the various pretreatment methods and used to dissolve cellulose and lignin. When the H₃PO₄ and acetone were used, 5-6% of the wood waste was found to be very appropriate for saccharification. Also, when the enzymatic saccharification was conducted in the mixture of the wood waste and 0.05 M citrate buffer solution, glucose and xylose were measured to be 80.2 g/L and 9.2 g/L respectively. Furthermore, ethanol obtained after 70 h of fermentation by *S. cerevisiae* was 30.4 g/L. As a result, the conversion yield from wood waste to bioethanol was calculated to be 57.4%. These results show that the pretreated wood waste can be used as good feedstocks for bioethanol production and that the H₃PO₄-acetone pretreatment can effectively increase the yield of ethanol production.

Keywords : wood waste, H₃PO₄-acetone, bioethanol, fermentation

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