

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belgaum 590 010



PROJECT REPORT ON

35S_B007

BIOFUELS FROM HEMICELLULOSE

(ETHANOL PRODUCTION)

Under Student Project Program of Karnataka state Council for Science and Technology (KSCST), Sponsored by Karnataka state Biofuel Development Board (KSBDB)

Submitted in partial fulfillment of the requirements for the award of the degree

MASTER OF TECHNOLOGY

IN

ENVIRONMENTAL ENGINEERING

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ABSTRACT

Lignocellulosic biomass can be utilized to produce ethanol, a promising alternative energy source for the limited crude oil. There are mainly two processes involved in the conversion: hydrolysis of cellulose in the lignocellulosic biomass to produce reducing sugars, and fermentation of the sugars to ethanol. The cost of ethanol production from lignocellulosic materials is relatively high based on current technologies, and the main challenges are the low yield and high cost of the hydrolysis process. Considerable research efforts have been made to improve the hydrolysis of lignocellulosic materials. Pretreatment of lignocellulosic materials to remove lignin and hemicellulose can significantly enhance the hydrolysis of cellulose.

An induced auto-hydrolysis were applied to *Eucalyptus globulus* wood chips prior to the cooking stage, to extract the hemicellulosic fraction. The obtained hydrolysates, rich in xylose, were detoxified by overliming and used for ethanolic fermentation. This procedure raised the fermentable sugar content and led to the production of ethanol.