

**ETHANOL PRODUCTION FROM GLUCOSE/XYLOSE MIXTURES BY
IMMOBILIZED *Zymomonas mobilis* ATCC31821(pZB5)
AND *Saccharomyces* 424A(LNH-ST)***

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Production of fuel ethanol from mixtures of glucose and xylose were studied with *Zymomonas mobilis* ATCC31821(pZB5) and *Saccharomyces* 424A(LNH-ST) immobilized by entrapment in κ -carrageenan gel beads. Batch experiments were employed to study the effect of glucose on xylose metabolism and the effect of ethanol on metabolism of both glucose and xylose. For the yeast strain, the addition of glucose to the media did not show any enhancement in the xylose utilization rates. On the other hand, the addition of 2.5 g/L glucose to the media almost doubled the xylose utilization rate by the *Z. mobilis* strain. However, higher glucose concentration did not significantly improve xylose utilization rates. The effects of ethanol on sugar metabolism were more pronounced for both strains. At 30 g/L initial ethanol concentration, utilization rates of glucose and xylose by the yeast were reduced equally by 23%. At this initial ethanol concentration, the utilization rates of glucose and xylose by the *Z. mobilis* strain were reduced by 28 and 46%, respectively.

Continuous ethanol production was studied in a fluidized-bed reactor (FBR) using feed solutions containing glucose and xylose at 40/20, 45/15, and 50/10 g/L, respectively. Three retention times of 2,3, and 4 hours were used. Complete glucose conversion was observed in all cases. Conversion of xylose was incomplete and increased with higher retention time. Maximum xylose conversion was 98 and 57% for *Zymomonas mobilis* ATCC31821(pZB5) and *Saccharomyces* 424A(LNH-ST), respectively.

Production of ethanol from actual hydrolysates in the FBR will be the focus of our future investigation.

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