

**Comparison of Ethanol Production from Lignocellulosic Sugars*
by Two Chromosomally Integrated Microbial Strains
in a Fluidized-bed Reactor**

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Continuous production of ethanol from a mixture of glucose and xylose by *Zymomonas mobilis* C25 and *Saccharomyces* 424A(LNH-ST) was studied. The two microbial strains contain the set of genes for xylose metabolism on their chromosomes. This integration removed the antibiotic requirement for maintaining plasmid stability in earlier strains. The cells were immobilized by entrapment in κ -carrageenan beads of average diameter of 2 mm. Ethanol production by these beads was studied in a fluidized-bed reactor of one-liter working volume. In the first experiment, a feed solution containing 40 g/L glucose and 20 g/L xylose was used with *Z. mobilis* C25 beads. The experiment was carried out at a retention time of 4.5 h for one month. Under these conditions, xylose conversion was maintained at 33% for the first ten days and then dropped to ~20% for the remaining of the experimental time course. On the other hand, glucose conversion was stable at above 90%. *Saccharomyces* 424A(LNH-ST) then was studied under the same set of conditions. Xylose conversion of 50% was maintained for the first 11 days. On day 12, it dropped suddenly to 25%. Glucose conversion was near completion during this period. This experiment is currently in progress. Experiments to study the effect of retention time on ethanol production by *Z. mobilis* C25 will be performed. The results from these experiments will be reported.

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