

Alcoholic fermentation by immobilized yeast in calcium alginate and chitosan covered calcium alginate beads

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The use of immobilized yeast is a promising technique for ethanol production. Studies have shown that immobilized cells have higher resistance to temperature, concentration of substrates and metabolites and a high yield for ethanol fermentation with higher activity. The proposal of this work is to immobilize *Saccharomyces cerevisiae* cells in calcium alginate and chitosan covered calcium alginate beads in order to observe the behavior of these beads for ethanol production.

The fermentation media was made of glucose 100g/L solution; 100g of beads containing approximately 50 g of cells (wet weight) were used in a batch reactor placed in an orbital shaker, at 200 rpm and, 30°C. The conversion time was approximately 6 hours for all runs. However, every fermentation cycle was run for 10 to 12 h. After each cycle, the beads were washed with distilled water and placed in a new fermentation media. After each fermentation cycle, the ethanol concentration was 40g/L.

Chitosan covered calcium alginate beads showed a longer conversion time and a slightly higher integrity of beads after eight fermentation cycles. Both calcium alginate and chitosan covered calcium alginate beads increase in volume during the fermentation cycles and show similar ethanol production.

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