Cell immobilization in alginate/PVA for levan production by *Zymomonas mobilis*

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Cell immobilization is defined as the restriction of viable cells in a determined space in the support structure, preserving the catalytical cells activity. The polysaccharides gels, more specifically the calcium alginate hydrogels, are best suited to preserve cell viability and metabolic activity. It is also possible to create beads with the immobilized microorganism utilizing a hybrid system formed by alginate and PVA solution mixed with cell suspension, the final product being dripped into sodium chloride solution. The bacterium *Zymomonas mobilis* grown on sucrose produces fructo-oligomers and extracellular levan, this reaction is catalyzed by levanasacarase enzyme which hydrolyzes sucrose and polymerizes fructose, mainly at pH 6.0. Thus, cells of *Zymomonas mobilis* in pre-determined concentration were mixed in a 1% sodium alginate solution and 7% PVA, then dripped in a 1% CaCl2 solution under agitation for 15 minutes, to form beads of calcium alginate/PVA. Then, 2 grams of beads were added to 50 mL flasks containing synthetic fermentation medium and sucrose concentration previously tested (50, 100, 250 and 300 g/L). The experiments were carried out for 96 hours, initial pH 5.7 in a controlled temperature of 30 °C without stirring. Samples were taken after 12, 18, 24, 48, 72 and 96 hours for analysis of the levan production, estimated indirectly on fructose units using the technique of Viikari (1984) with modifications Moro et al. (2011). The highest levan yield (1.4 g/L) was obtained in 48 hours of fermentation, on the 100 g / L sucrose concentration.