

ETHANOL PRODUCTION BY IMMOBILIZED CELLS FROM SUGARCANE MOLASSES

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The ethanol industry in Brazil has great importance to the national economy. Brazil is produced million tons of sugarcane molasses per year during the manufacture of sugar. Several authors have studied the effect of the addition of sugarcane molasses in the culture medium for ethanol production. Some bacteria such as *Zymomonas mobilis* (Gram-negative and facultative anaerobic) have the ability to produce ethanol at level comparable or even superior to yeast obtained by transforming sugars into ethanol and carbon dioxide. This bacterium can also produce levan gum, sorbitol and other byproducts in smaller or larger amounts, depending on the fermentation conditions. The cell immobilization technique offers certain advantages over the use of free cells during fermentation it protects cells and it possible to reuse the cells for several fermentation cycles. Thus, this study aimed to evaluate the ethanol production by *Zymomonas mobilis* CCT 4494 immobilized in sodium alginate beads, under sugarcane molasses concentration (60° brix), incubation temperature 30 °C, and 12, 24, 36 and 72 hours of fermentation, with cell reuses. The synthetic initial pH was adjusted to 5.7. A solution of sodium alginate 2% inoculated with bacterium *Z. mobilis* was dripped into CaCl₂ 3% for beads formation. These were incubated in a synthetic medium constituted in g/L: yeast extract 5.0; KH₂PO₄ 1.0; (NH₄)₂SO₄ 1.0; and MgSO₄.7H₂O 1.0 and added with sugarcane molasses. The ethanol concentration was determined using a gas chromatograph, was determined in accordance with retention time of pure samples of the standard curve. The maximum amount of ethanol was 41.2 g / L after 48 hours of fermentation. The cell immobilization is an effective technique that brings economy to the fermentation process and aggregate the low cost substrate.

Keywords: Ethanol, Sugarcane Molasse, *Zymomonas mobilis*

CAPES