

## SUGAR PRODUCTION BY ENZYMATIC HYDROLYSIS OF SUGARCANE BAGASSE

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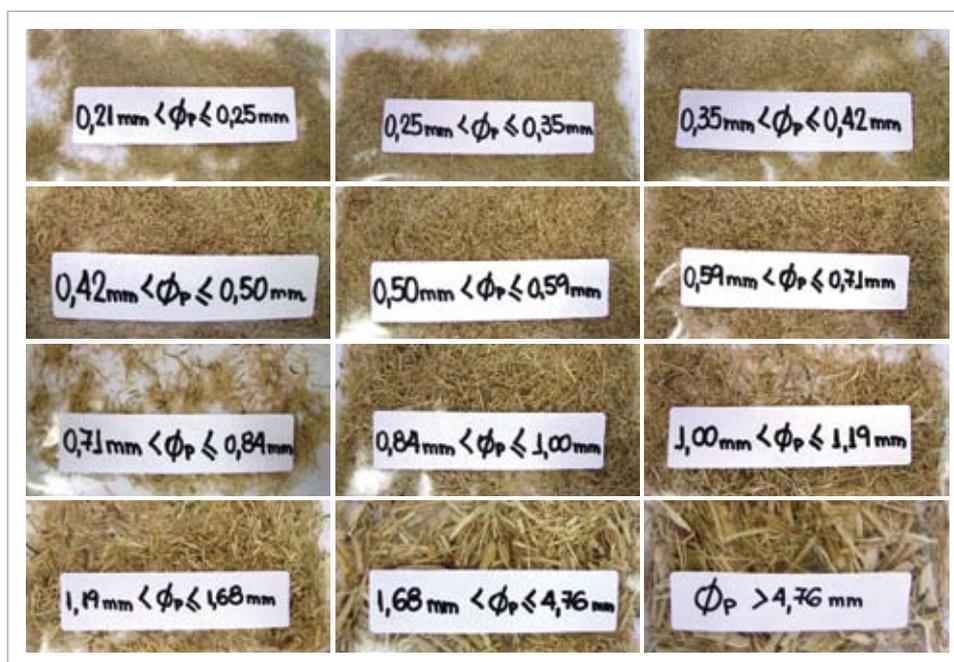


Figure 1. Granulometric analysis of sugarcane bagasse

The modern chemical industry obtains more than 90% of the raw material for synthesis of organic molecules from oil. The rise in oil prices and the concerns and pressures of society to climatic changes, presenting challenges that this industry needs to overcome in the near future. The most viable alternative at this moment is the use of renewable raw material, such as lignocellulosic biomass available in the agricultural waste. The use

of renewable resources represents an important development activity in emerging countries. However, these resources, natural and with high energy potential, are not properly exploited as a source of energy and raw materials for the chemical industry. The most important agricultural residues in the national territory, sugarcane bagasse certainly occupies a position of great prominence. Domestic production of sugarcane in 2009 reached about 569 million tons, destined to the production of sugar and alcohol. It implies the recognition that the annual production of sugarcane bagasse reaches several huge numbers and the use of this waste is a national need. Therefore, the conversion of the cellulosic component of sugarcane bagasse into sugars, for them to be used as a source of raw material for the chemical industry is of great economic interest. In this sense, this project approaches the development of technology for the conversion of lignocellulosic fraction of sugarcane bagasse in a broth rich in sugars, which will serve as substrates for the production of specialty chemicals.

## SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The intention of this project is to develop the technology for conversion of lignocellulosic residues (bagasse) in a product rich in fermentable sugars and a development that has a partnership with the Oxiteno Corporation and FAPESP.

The aim is to obtain a raw material for low cost, through biotechnology, adequate to produce various products with high added value of interest Oxiteno. Reducing the cost of raw materials is a key factor to boost the biotechnological production of chemicals (white biotechnology). The success of the project will attract investment in such projects for the country. Thus, not only the applicant company will increase its competitiveness in the market for specialty chemicals, but you can increase the competitiveness of the production of cane sugar.

The use of lignocellulosic biomass basically involves processes: pretreatment, hydrolysis of cellulose contained in the lignocellulosic materials into sugars and chemical or biotechnology transformation of these to obtain new products. In this development it was decided by the process of steam explosion as a technique of bagasse pretreatment.

The objective of this project is to study the production of sugars by enzymatic hydrolysis process of sugarcane bagasse pretreated with steam explosion. These sugars will serve as substrates for the production of specialty chemicals. To achieve the proposed objective will be developed the following steps:

- study of steam explosion pre-treatment;
- study the effect of bagasse delignification;
- study the process variables on the enzymatic hydrolysis kinetics of sugarcane bagasse.

## MAIN PUBLICATIONS

The project is in its early stage of development and has been completed the steps of design, acquisition, installation and preliminary tests of the equipment for steam explosion of bagasse.

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