

## **Evaluation of the ozone as a pretreatment for sugarcane bagasse enzymatic hydrolysis**

R. Travaini<sup>1\*</sup>, M. D. M. Otero<sup>2</sup>, M. Coca<sup>3</sup>, R. Da-Silva<sup>1</sup>, E. Gomes<sup>1</sup> and S. Bolado<sup>3</sup>

1 - Laboratory of Biochemistry and Applied Microbiology, Universidade Estadual Paulista, (IBILCE/UNESP), São José do Rio Preto, Brazil; 2 - Universidad del Valle, Cali, Colombia; 3 - Departament of Chemical Engineering and Environmental Technology, Universidad de Valladolid, Valladolid, Spain.

\*email: rtravaini@gmail.com

The development of new energy sources is the biggest challenge of the XXI century. One of the most promissory alternatives aiming to provide renewable energy and substitute oil fuels is bioethanol. In Brazil, one of the pioneering producers, the ethanol from sugarcane production is consolidated generating large amounts of bagasse which have a great energy potential but are managed actually as a waste. The saccharification of this bagasse can increase the production in three times without increasing the cultivated area. The main constraint to produce ethanol from the bagasse is the enzyme low efficiency, or inefficiency for the fermentable monosaccharides release from the lignocellulosic substrates, that makes the process expensive and unviable economically. This occurs because of the protecting barrier effect that lignin makes on the lignocellulosic material complex structure, preventing the enzymatic hydrolysis. In this way, this work is focused on the ozone oxidation of sugarcane bagasse to remove and solubilize the lignin. The bagasse was oxidized passing an ozone-air flow through a bagasse fixed bed. The ozone treatment decreases the total lignin concentration but mainly open the lignocellulosic structure transforming the acid insoluble lignin into acid soluble lignin. The treated bagasse was submitted to electronic microscopy, and morphological changes were observed. Enzymatic hydrolysis of ozone pretreated bagasse, using the commercial enzymes NS0010 and NS0013 (Novozymes, Denmark), showed remarkable sugar release increase from cellulose (6 to 50%) and hemicellulose (2 to 32%) components.

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