
# Efficiency of dilute sulfuric acid pretreatment of distillery stillage in the production of cellulosic ethanol

D. Mikulski, G. Kłosowski

PII: S0960-8524(18)31099-X
DOI: https://doi.org/10.1016/j.biortech.2018.08.005
Reference: BITE 20288

To appear in: *Bioresource Technology*

Received Date: 13 June 2018
Revised Date: 31 July 2018
Accepted Date: 2 August 2018

Please cite this article as: Mikulski, D., Kłosowski, G., Efficiency of dilute sulfuric acid pretreatment of distillery stillage in the production of cellulosic ethanol, *Bioresource Technology* (2018), doi: https://doi.org/10.1016/j.biortech.2018.08.005

# Efficiency of dilute sulfuric acid pretreatment of distillery stillage in the production of cellulosic ethanol

Mikulski D., Kłosowski G*.

*Kazimierz Wielki University, Department of Biotechnology, 85-671 Bydgoszcz, ul. K. J. Poniatowskiego 12, Poland*

## Abstract

The aim of this study was to examine suitability of distillery stillage of various origins subjected to dilute sulfuric acidic pretreatment for production of cellulosic ethanol. Optimal conditions for dilute acid pretreatment of: rye and wheat distillery stillage 121°C, 0.2 M $H_2SO_4$, 60 minutes; maize stillage 131°C, 0.2 M $H_2SO_4$, 60 minutes. The highest efficiency of enzymatic hydrolysis was achieved for rye and wheat stillage using 1 g of DW and the concentration of cellulolytic enzyme of 24% w/w, and for maize stillage 3 g of DW and enzyme concentration of 24% w/w. The use of rye and wheat stillage for production of ethanol does not require a detoxification process and enables full attenuation of glucose after 48 h of the process. However, the use of maize stillage as a raw material must be preceded by a detoxification process that guarantees a reduction of 5-hydroxymethylfurfural concentration in the fermentation medium.

**Key words:** distillery stillage, cellulolytic ethanol, dilute sulfuric acid pretreatment

## 1. Introduction

Decreasing fossil fuel resources coupled with increasing environmental pollution have induced the search for alternative energy sources. Bioethanol is one of the renewable energy sources of growing importance. It can be used directly as a fuel for internal combustion engines or as an addition to gasoline. The widespread use of ethanol as a biofuel is reflected

* Corresponding author. Tel.: +48 (052) 32-59-220, fax: +48 (052) 37 67 930

*E-mail address:* klosowski@ukw.edu.pl (G. Kłosowski)