10th World Congress on
Green Chemistry and Technology
July 10-11, 2019 | Paris, France

Optimizing the enzymatic hydrolysis of cellulose from pretreated waste biomass via response surface methodology

Luciene S de Carvalho[1], **Leila M A Campos**[2], **Heloise O M A Moura**[1] and **Luiz A M Pontes**[3]
[1]Federal University of Rio Grande do Norte (UFRN), Brazil
[2]Salvador University (UNIFACS), Brazil
[3]Federal University of Bahia (UFBA), Brazil

This work investigated the potential of cellulose isolated from sugarcane bagasse after a combined acid/peroxide-alkaline (APA) pretreatment, soda/AQ pulping and bleaching steps for producing glucose via enzymatic hydrolysis by using two different enzyme complexes with a full factorial 24 design of experiments (DOE) approach. This research contributes with the accurate statistical assessment of the importance of biomass pretreatment in cellulose digestibility by Celic CTec3 (CT) and Celluclast®1.5 L (CL) enzyme complexes and of how the blend of these two complexes can interfere on the saccharification mechanism. The results showed cellulose and CT factors as having the higher effects on glucose yield; in fact, the response surface methodology (RSM) approach showed that cellulose from pretreated sugarcane bagasse (SBC) presented double the conversion observed for the commercial cellulose (CC), and the CT activity significantly increased when used in conjunction with the CL complex. The design of experiments was able to prove that the morphology and crystallinity of the cellulose feedstock selected for conversion is a factor which has a major effect on glucose production.