

BIOMASS PRETREATMENTS TO OPTIMIZE BIOETHANOL PRODUCTION

Summary

Different technologies can be studied and combined to optimize biomass pretreatment:

- The combination of different physic-chemical and enzymatic technologies in the field of biomass pretreatment. This would include the study of ozone/plasma pretreatment to increase the accessibility of biomass substrates for hydrolytic enzymes and to eliminate lignin from biomass or its residues prior to enzymatic hydrolysis.
- Application of specific ionic liquids (low-cost ionic liquids -deep eutectic solvents-) developed for biomass pretreatment prior to enzymatic hydrolysis could lead to promising results to improve solubilization. Also combination of ionic liquid treatments with low-energy consumption techniques such as ultrasound or microwave.
- Optimization of the enzymatic hydrolysis process alone or together with the former technologies.
- Study of ionic liquids and other extraction technologies for detoxification of biomass together with cellulose solubilization could be studied.
- Physico-chemical and thermal characterization of biomass/wastes and their ashes and Biogas generation from biomass wastes.

Applications

This technologies are directed to biotehanol production plants which would like to optimize their yields from biomass resoruces and lead the processes to more environmentally friendly technologies. Also the technologies can be of the interest of biomass producers and enzyme/technology producers (ozone, ionic liquids) who would like to obtain better results or new applications of their products

Patent application number

Non patented results

Priority date

References

1. Methods for Pretreatment of Lignocellulosic Biomass for Efficient Hydrolysis and Biofuel Production. Kumar et al., Ind. Eng. Chem. Res., 2009, 48 (8), pp 3713-3729
2. <http://newscenter.lbl.gov/feature-stories/2009/07/08/fuels-from-biomass-ionic-liquids/>
3. Mitigation of cellulose recalcitrance to Enzymatic hydrolysis by ionic liquid pretreatment. Dadiet al. Applied Biotechnol. and Bioengg 136-140 2007 407-421