Rachna Dhir et al., J Fundam Renewable Energy Appl 2017, 7:7 (Suppl)
DOI: 10.4172/2090-4541-C1-038

Comparing pretreatment and subsequent hydrolysis maximum total sugar yielding conditions organosolv pretreatment to CELF pretreated poplar

Rachna Dhir[1], **Rajeev Kumar**[2], **Charles Cai**[1] and **Charles Wyman**[1]
[1]University of California Riverside, USA
[2]Oak Ridge National Laboratory, USA

Lignocellulosic biomass consists of strong interlinked components as cellulose, hemicellulose and lignin. Pretreatment is an important step to recover these structural components from lignocellulosic biomass structure for their higher accessibility during enzymatic hydrolysis stage. Various pretreatments assist disruption of the lignocellulosic structures. However, aqueous pretreatments comes with added advantage of solvent recovery and reuse. Combined sugar yields from pretreatment (Stage 1) and enzymatic hydrolysis (Stage 2) at the end of 7 days used to identify the maximum total glucose and xylose yields for ethanol organosolv pretreated poplar were compared to the maximum total sugar yielding conditions for THF co-solvent enhanced lignocellulosic fractionated (CELF) pretreated wood. Ethanol organosolv pretreatment applied in this study to identify the maximum total sugar yielding conditions for poplar wood resulted in highest combined total sugar yields of 78.2% at 185°C-15min compared to CELF pretreatment conditions as 160°C-15min illustrating 100% yields at 15mg/g glucan in raw biomass enzyme loading used during hydrolysis stage. Ethanol organosolv pretreated wood showed lower lignin removal of 85% in comparison to the CELF pretreated biomass with over 90% removal during the pretreatment stage. Negligible degradation product formation during CELF pretreatments in comparison to ethanol organosolv makes CELF a desired pretreatment for ethanol fuel production. Focus of the present study is to enumerate the change in yields for the two pretreatments and discuss the advantages of using CELF over organosolv for further insight.

Biography

Rachna Dhir is PhD candidate at Chemical and Environmental Engineering, UCR Center for Environmental Research and Technology (CE-CERT). She is a co-author of Mechanisms and characteristics of Biological pretreatment used for lignocellulosic biomass. She also worked as Undergraduate Student Mentor in University of California, Riverside, CA. she is currently primary author of few upcoming publications.

rajesh.munirathinam@mines-albi.fr

Notes: