

# Past and Present Research Systems of Green Chemistry

September 14-16, 2015 Orlando, USA

## Thermo-chemical pre-treatments for the combined recovery of extractives and bioethanol production from douglas-fir bark

Cecilia Sambusiti, Chloé Navas, Eric Dubreucq and Abdellatif Barakat  
INRA UMR IATE, France

The presence of bark in wood can constitute a serious limitation for the bioconversion of forest residues into bioethanol, especially due to the presence of high content of extractives, which may inhibit ethanol fermentation. However, a perfectly debarked wood chip may not represent an economical source of carbohydrates for industrial applications. An option is to utilise bark as a source of renewable energy and chemicals, within a biorefinery platform. In this study, enzymatic hydrolysis and bioethanol fermentation of Douglas-fir bark were studied before and after organosolv and diluted acid pre-treatments performed at 150°C and 180°C. The recovery of valuable platform molecules was also determined after pre-treatment. Results showed that an organosolv-free acid pre-treatment performed at 150°C gave the best results in terms of platform molecules recovery (40% w/w) and bioethanol yield (2 g.100g<sup>-1</sup> total solids). However, the low glucose and ethanol yields obtained (6% and 16% of the theoretical values, respectively) confirmed that enzymatic hydrolysis remains the limiting step of bioethanol fermentation from bark. Interestingly, ethanol was produced without inhibition of fermentation from the untreated and pretreated substrates.

### Biography

Cecilia Sambusiti completed her PhD in March 2013 from Politecnico of Milan (Italy). Actually, she is engaged in a Postdoctoral work at the French National Institute for Agricultural Research (INRA, UMRIATE) in Montpellier (France). She has an academic background in environmental engineering combined with a practical work experience in catalytic processes (mechanical, thermal, chemical and enzymatic) and biological processes (anaerobic digestion, dark fermentation, ethanol fermentation). She is author and co-author of 13 refereed journal publications, 1 book chapter, and 10 international refereed conference publications.

[cecilia.sambusiti@supagro.inra.fr](mailto:cecilia.sambusiti@supagro.inra.fr)

Notes: