## conferenceseries.com

## 2<sup>nd</sup> International Congress and Expo on Biofuels & Bioenergy August 29-31, 2016

August 29-31, 2016 Sao Paulo, Brazil

## Cellulose-derived carbon aerogel as catalyst support Part I: Improving carbon yield and further resistance to oxidant atmosphere

Luis E Arteaga Perez<sup>1</sup>, Oscar Gomez<sup>1</sup>, Romel Jimenez<sup>1</sup> and Ljubisa Radovic<sup>2</sup> <sup>1</sup>University of Concepcion, Chile <sup>2</sup>PA State University, USA

During the last decade, the interest for developing carbon-based structures have been renewed. Among several candidates, carbon aerogels (CAGs) have demonstrated potential for several applications such as catalyst supports, adsorbents, electrodes and supercapacitors for secondary batteries. This research focuses on the production of wisely designed carbon structures for its use as catalyst support for the elimination of tars and ammonia form biomass-derived syngas. The main drawbacks in preparing CAGs from cellulose are related to the low mass yields obtained (<15%) during carbonization and to the unstability of the carbon when it is used for applications involving high-temperature oxidant atmospheres. Here, we report on the mechanisms and thermal behavior of treated cellulose nanofibers that were pre-treated with a flame retardant ( $(NH_4)_2SO_4$ ). The CAGs precursor are freeze-dried nanocellulose fibers provided by the University of Maine. The presence of  $(NH_4)_2SO_4$  reduces the production of tars by inhibiting the levoglucosan formation and also it promotes further decomposition of levoglucosan by the carbon-promotor route. The concentration of  $(NH_4)_2SO_4$  affects the activation energy of pyrolysis as well as the final carbon yield, which is mostly associated to crosslinking, scission and cracking of bonds. The compositional, morphological and textural characterization of the CAGs precursor was carried out by Elemental Analysis, TGA-MS, ICP-OES, FT-IR, XRD, SEM and nitrogen adsorption.

## Biography

Luis E Arteaga Perez has completed his PhD in 2010 at the UCLV, Cuba and after that he was Visiting Post-doc in the University of Ghent, Belgium where he worked in the Laboratory of Thermochemical Conversion under the supervision of Professor Wolter Prins. At this moment, he is working as a Researcher at the Unit of Technological Development in Chile. He has published several papers in well-ranked journals and has been serving as Reviewer in reputed journals like *Energy, Chemical Engineering Journal, Journal, Journal of Cleaner Productions*, etc.

I.arteaga@udt.cl

Notes: