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The Production of Bio-Based Chemical Compounds (Oligomers & Small Organic Molecules) in Sub- and Supercritical Water from Lignocellulosic Biomass

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The 17th Conference of the Parties (COP17) to the United Nations Framework Convention on Climate Change (UNFCCC) held in 2011 in Durban. Everybody is now conscious of the necessity to reduce its ecological footprint with, for instance, better using natural resources. This is the reason why the choice of the synthesis of molecules from renewable resources is now a widely research area.

For the chemist, a supercritical fluid is a solvent which is used in specific conditions of temperature (T) and pressure (p), *i.e.* beyond the critical temperature (T_c) critical pressure (P_c) of the fluid considered. The properties of these supercritical fluids can be continuously modulated and thus properties of the liquid adjusted to those of the gas by simple variations of pressure and temperature. These fluids have ”hybrid” properties between those of the liquids and the gases.

Taking advantages of these particular properties, the chemists have used supercritical fluids for years to carry out chemical syntheses to produce organic products [1] and inorganic compounds [2]. In the context of the development of sustainable processes, the knowledge of the chemical reactivity in supercritical fluids allows to design processes operating in supercritical conditions using lignocellulosic biomass in order to produce some small interesting molecules [3].

In this talk, we will present some new results on the production of oligomers and also small organic molecules from lignocellulosic biomass, particularly from cellulose with a hydrothermal treatment. The efficiency of some original catalysts on these reactions will be also presented.

[1] BRENNECKE, J.F., Chateauneuf, J.E., Chemical Reviews, Vol.99 **1999**, p.433

[2] AYMONIER, C., LOPPINET-SERANI, A., REVERON, H., GARRABOS, Y., CANSELL, F., Journal of Supercritical Fluids, Vol.38, **2006**, p.242

[3] LOPPINET-SERANI, A., AYMONIER, C., CANSELL, F., ChemSusChem, Vol.1, **2008**, p.486