Petrochemistry-2013

World Congress on
Petrochemistry and Chemical Engineering

November 18-20, 2013 Hilton San Antonio Airport, USA

The biolignin™: key element of the future lignocellulosic biorefineries

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Abstract

The CIMV refinery process which allows the separation without degradation of the three main components of the vegetable matter: cellulose, hemicelluloses and lignins is cloned on the oil refining process that first carried out the separation of the various components of crude oil. In the first stage the vegetal matter is treated, at atmospheric pressure, by a mixture of acetic acid and formic acids, which dissolve lignin and hydrolyze the hemicelluloses into oligo and monosaccharides with high xylose content. The raw pulp is filtered. The pulp is then treated with hydrogen peroxide. The commercial value of the raw pulp is close to the eucalyptus chemical pulp and very suitable for bioethanol production. The organic acids are then recycled by evaporation from the organic solution. The remaining extraction liquor is then treated with water to precipitate lignin which is then easily separated by filtration. Without purification, the raw C5 sugars syrup looks like molasses and can be used for C5 production for a lot of industrial applications. Pure C5 sugars can be easily obtain and used for a remarkable bioethanol production. This is the first technology worldwide which allows the transformation of C6 and C5 sugars, from a lignocellulosic raw material, with a quantitative yield.
Our lignin showed new unusual linear oligomeric structures. This lignin extracted quantitatively and selectively, named biolignin™, trade mark of CIMV, is of outstanding interest in chemical and biochemical industries due to its remarkable capacities to substitute weight / weight phenol and carbon black in their industrial uses. Under these conditions, the CIMV biorefinery of lignocellulosic raw materials, like cereal straws, hardwoods, sugar cane bagasse, switch grass, etc.., becomes very profitable, without subsidy, whatever the place in the world. Moreover, it is a perfectly clean technology. A pilot unit is in operation and two demonstration plants are currently under construction.

Biography

Michel Delmas has completed his PhD at the age of 24 years from University of Toulouse – France in 1971 and then postdoctoral studies from the University of Montreal. He was Assistant Professor at the University of Phnom Penh – Cambodia, Associate Professor at the University of Sfax Tunisia and, since 1983 Professor at the University of Toulouse. He has published more than 200 papers in reputed international journals and registered more than 60 international patents. (www.biomass-chemistry.com) He has created CIMV Inc. in 1998 to develop his biorefinery technology. (www.cimv.fr)