



MONEY FROM LIGNIN

One can make anything from lignin, except money; this old proverb from the paper industry might soon be proved wrong.

Lignin, also known as crude fiber, is one of the most abundant organic compounds. Lignin works as “concrete” in the cell walls of plants, where it gives hardness and strength to the plant, as well as protects against numerous diseases and fungi. This naturally means that lignin is a “tough” compound that can be difficult and expensive to convert into base chemicals and oil; therefore the adage “One can make anything from lignin, except money”. This means that in the paper and bioethanol industries lignin is a waste- or byproduct with little to no value, usually sold as a low grade fuel to CHP’s (combined heating and power plants).

As second generation bioethanol plants become more and more widespread, making them economically feasible becomes increasingly important. This can be done by better utilizing the biggest byproduct, lignin. Via a pro-

cess called Hydrothermal liquefaction, HTL, lignin can be converted into oil and other value-added compounds. The HTL process has been studied since the 1970s, but it has only been an economical success in very few cases, namely in cases where the feed was either free or of negative value, such as hazardous waste. This is of course problematic, since the idea to compliment 2nd generation bioethanol plants with HTL processes is to increase the economic feasibility.

In this project we try to eliminate some of the previous issues with HTL plants. By having constant stirring of the feed and oscillating flow in the system we don’t need the biomass slurry feed to be stable, as the turbulence will keep the biomass suspended. This will lower the demand for pretreatment. By designing the plant as a plug flow reactor we will get a well-defined temperature profile, which, in theory,



should give a purer product with fewer different compounds. This will lower the demand for product separation. Also, as opposed to previous plants, we are focusing more on chemicals and binders than on fuel oil, which will increase the value potential of the products.



A pilot plant is a development stage in-between lab scale and commercial scale. It is a valuable development procedure that can be used to get an idea of whether or not a process is economical feasible.

This pilot plant is approximately 3x3x8 m and is able to process up to 60 litres biomass slurry per hour.

So, what is all this good for? Well, we hope that HTL processes can help further the development of 2nd generation bioethanol plants, at the same time as the HTL products can gain market that is currently occupied by the fossil fuel industry.

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