



Autothermal Pyrolysis

The fast pyrolysis process development unit (PPDU) located at the BioCentury Research Farm has been in operation since 2009 and serves as a test bed for pilot-scale deployment of technology developed within the Bioeconomy Institute. The PPDU is able to process a wide variety of feedstocks including both woody and herbaceous material into higher-value bio-oil intermediates using fluidized bed technology and a novel stage fractionation collection system. The pilot system can process 22 kilograms of biomass per hour continuously. Development of the stage fractionation process has resulted in several breakthroughs in the utilization or targeted upgrading of specific stage fractions into fuels, chemicals and products.

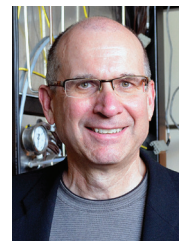
Accomplishments

- » Awarded a patent for multi-stage, online fractionation of bio-oil.
- » Completed ground up redesign and redeployment to integrate industry level automation, controls and data acquisition systems.
- » Successfully accomplished continuous processing of pretreated biomass and online recovery of sugars, phenolic oil and biochar from woody and herbaceous biomass.
- » Achieved autothermal pyrolysis using 100 percent air fluidization.
- » Developed process intensification through autothermal operation resulting in tripling the capacity of biomass throughput using the same reactor footprint.
- » Increase sugar yield from corn stover 15 times through successful pretreatment methods.
- » Became a test bed for ongoing research into material selection for corrosion resistance in thermochemical liquefaction environments.

Current/Future Work

- » Pilot testing for a 50 ton per day modular Autothermal Py-Refinery with integrated biomass pretreatment and product recovery for the production of fermentable sugars, phenolics, and high porosity biochar.
- » Ongoing large volume production of bio-oil for internal and external R&D customers.

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