

PY REFINERY: THERMAL FRACTIONATION OF LIGNOCELLULOSIC BIOMASS INTO DIVERSE BIOBASED PRODUCTS

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Iowa State University has developed a fractionating recovery system that recovers bio-oil from the pyrolysis of lignocellulose as stage fractions with unique chemical and physical properties. We have been able to extract from these stage fractions concentrated streams of anhydrosugars, phenolic monomers, phenolic oligomers, and acetate. The anhydrosugars have been successfully fermented to ethanol and catalytically upgraded to gluconic acid; the phenolic monomers are being explored for the production of carbon fibers; the phenolic oligomers have been formulated into bio-asphalt and renewable fuel oil; the acetate stream has been fermented to lipid-rich algae, catalytically upgraded to alcohols, combined with ethanol to produce gelled fuel, and is being explored for the production of bio-cement for road construction or ground improvement. We are evaluating the feasibility of a py refinery that would produce these several products. This talk describes the various products, the processes by which they are refined, and the economics of a py refinery.